Montana Fish, Wildlife & Parks

2016 Report on Aquatic Invasive Species Monitoring

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Aquatic Invasive Species Program
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The Montana Fish, Wildlife & Parks (FWP) Aquatic Invasive Species (AIS) Program works to implement the AIS Management Plan through coordination and collaboration, prevention of new AIS introductions, early detection and monitoring, control and eradication, and outreach and education. The goal of the AIS Management Plan is to minimize the harmful impacts of AIS through the prevention and management of AIS into, within and from Montana. The report for the Early Detection and Monitoring program for 2016 follows.

I. Early Detection and Monitoring – Background

Montana's Aquatic Invasive Species (AIS) early detection and monitoring program has been in place since 2004. Early detection allows Montana Fish, Wildlife & Parks (FWP) biologists to locate small or source AIS populations, while monitoring allows FWP to study current population trends. FWP monitors for all aquatic invasive species, including zebra/quagga mussels (ZM/QM), New Zealand mudsnails (NZMS), Eurasian watermilfoil (EWM), flowering rush (FR), and curlyleaf pondweed (CLPW) as well as other species not known to occur in Montana. Plankton sampling for ZM, QM, and Asian clam veligers (microscopic larvae) has increased each year, in part due to an increase in volunteer sampling efforts as well as increasing FWP effort. To aid in AIS monitoring, FWP employees – including fish health staff and regional biologists and technicians – have been trained in AIS species identification and often contribute to or assist program staff with sampling effort. FWP staff are often sampling high risk waters for other purposes, and additional AIS sampling increases overall efforts with less travel cost for AIS staff in Helena. Overall monitoring and early detection efforts have increased steadily over the years. Early detection and monitoring are an important aspect of any effective aquatic invasive species program.

II. Monitoring Methods

FWP assesses the risk for AIS introductions to waterbodies annually. Variables used in determining risk are constantly evolving. Sites are prioritized based upon the previous years' work conducted by FWP, available calcium and water quality data as well as that collected by FWP, angler/boater pressure, boater movement data from watercraft inspection stations, monitoring conducted by other state and federal agencies, surface-water hydrology of the system, and other assorted variables. For effectiveness, at the end of 2016, Montana FWP began refining a newly developed matrix to prioritize all waters in Montana for monitoring.

Montana utilizes a variety of techniques in monitoring for AIS species. Plankton sampling involves the collection of microscopic organisms in the water column using specialized, fine mesh nets and analyzing those samples at the FWP Aquatic Invasive Species Laboratory in Helena. Cross-polarized light microscopy is the method utilized by the laboratory to detect the larvae (veligers) of invasive bivalves such as Dreissenid mussels and Asian clams. Polymerase Chain Reaction (PCR) testing or the amplification of environmental

deoxyribonucleic acid (eDNA) is used as a confirmation of microscopy findings for verification, if necessary, by the Montana FWP AIS Laboratory. Any DNA tests are conducted by independent laboratories as the FWP AIS laboratory does not have the equipment or training to conduct this type of analysis in-house. Invertebrate sampling involves the use of kick nets and rock picking to search for invasive species while identifying native species and noting population densities of AIS. Fish pathogens, such as whirling disease, are considered AIS and therefore FWP conducts pathogen testing in fish in conjunction with other AIS monitoring in coordination with the FWP Fish Health Laboratory in Great Falls. All of Montana's monitoring protocols have been scientifically reviewed, are updated annually, and are coordinated with neighboring states.

The movement of fish could also be a substantial vector for transferring AIS. FWP moves large numbers of fish through both its hatchery and wild fish transfer programs. Hatcheries cannot receive certification to sell or move fish without passing an AIS inspection. To accomplish this, the FWP Fish Health Laboratory and the Aquatic Invasive Species Laboratory work very closely together to inspect all federal, state and commercial hatcheries annually as well as source waterbodies for any transfer of wild fish stock. These AIS inspections include both on-site AIS surveys and disease/pathogen testing in fish. AIS program protocols include monitoring for all aquatic invasive species taxa whenever possible. While multiple other agencies and organizations assist in monitoring throughout the state (usually with plankton sampling), FWP routinely monitors for all taxa while conducting standard monitoring.

FWP has always sampled for macrophytes, but focused on point-intercept sampling at high risk sites unless assisting partners with in-depth plant mapping. In 2013, FWP integrated Montana Department of Agriculture's plant specialist into its AIS program and began performing comprehensive aquatic plant sampling in select water bodies throughout the state to locate or confirm aquatic invasive plant populations. Sampling occurs from early summer until plants begin to die off with colder water temperatures. Typically, sampling occurs from June to October though sampling dates can fluctuate with temperatures and spring runoff. While sampling, FWP notes presence of all aquatic plants and identifies them to species when feasible. Sampling protocols include littoral point sampling, point-intercept sampling, snorkel surveys, and sampling entire stretches of rivers focusing on depositional areas where plants would settle and establish. The monitoring crew responsible for plant mapping is also trained in identifying other AIS species and collects plankton samples and conducts invertebrate surveys.

In 2016, FWP's AIS program had five permanent staff (two in Kalispell, two in Helena and one in Glasgow) conducting early detection and monitoring surveys in addition to their other duties (hiring and supervision of watercraft inspection stations, addressing equipment and inventory needs for watercraft inspection stations, etc.). One of the Helena permanent staff hired, trained and supervised a plant survey team of seasonal workers which will be discussed more in depth later in the document. And finally, FWP hires about 65 watercraft inspectors

annually. Roughly fifteen of those inspectors work at roving locations at various waterbodies throughout the state. Part of those inspectors' duties is to collect plankton samples from each location they visit. These people all make up the primary work force conducting most of the monitoring in the state.

III. 2016 Results

In 2016, a total of 135 waterbodies, 499 unique sites and 581 total sites were inspected in Montana.

New populations of AIS were found in 2016 by FWP at the following locations: curlyleaf pondweed in the Smith River; New Zealand mudsnails were found on Upper Holter Lake at Gates of the Mountains. Dreissenid mussel larvae were detected at Tiber Reservoir but no adult populations could be in 2016. Canyon Ferry Reservoir and Missouri River (York Island Fishing Access Site) samples tested suspect for Dreissenid mussel larvae and a sample from the Milk River tested inconclusive for Dreissenid mussel larvae.

Table 2 on page 15 provides a complete listing of 2016 monitoring locations which includes AIS species observed as well as sites where no AIS were detected. Note that this table only shows the results for 2016 monitoring conducted by FWP, not previous years' results or results from surveys conducted by other agencies or organizations. Findings in 2016 also include the following:

- No adult populations of ZM/QM or Asian clams were detected this year or in previous years on Montana waters.
- No Dreissenid mussel larvae had ever been detected in Montana water samples prior to 2016.
- No Asian clam (*Corbicula spp*.) veligers were detected in the plankton samples processed by the FWP AIS Laboratory in Helena in 2016 or in previous years for any Montana waters.
- New Zealand mudsnails continue to persist at Darlington Ditch, Hauser Lake, Bluewater Creek, the Yellowstone River, the Beaverhead River, the Jefferson River, the Ruby River and on the Missouri River below Holter Dam.
- Eurasian watermilfoil continues to persist at Fort Peck Reservoir, Noxon Rapids Reservoir, Cabinet Gorge Reservoir, Beaver Lake, Jefferson Slough, Jefferson River, and the upper Missouri River.

Curlyleaf pondweed remains on the Bitterroot River, Cabinet Gorge Reservoir, Canyon Ferry Reservoir, Clark Canyon Reservoir, Beaverhead River, Jefferson River, Fourchette Bay of Fort Peck Lake, Hauser Lake, Holter Lake, Ennis Lake, Hebgen Lake, Madison River, Missouri

River, Noxon Rapids Reservoir, Clark Fork River, and Post Creek.Figure 1 illustrates the statewide emphasis placed on AIS monitoring. It includes AIS monitoring sites over the past eleven years, including sites monitored in 2016. All high risk sites are inspected annually at a minimum, while lower risk sites are surveyed less frequently. The program goal is to comprehensively monitor the state every year, and all types of waterbodies (lakes, reservoirs, ponds, creeks, rivers, etc.) are included.

Figure 1: Map of AIS sampling locations, 2005-2016

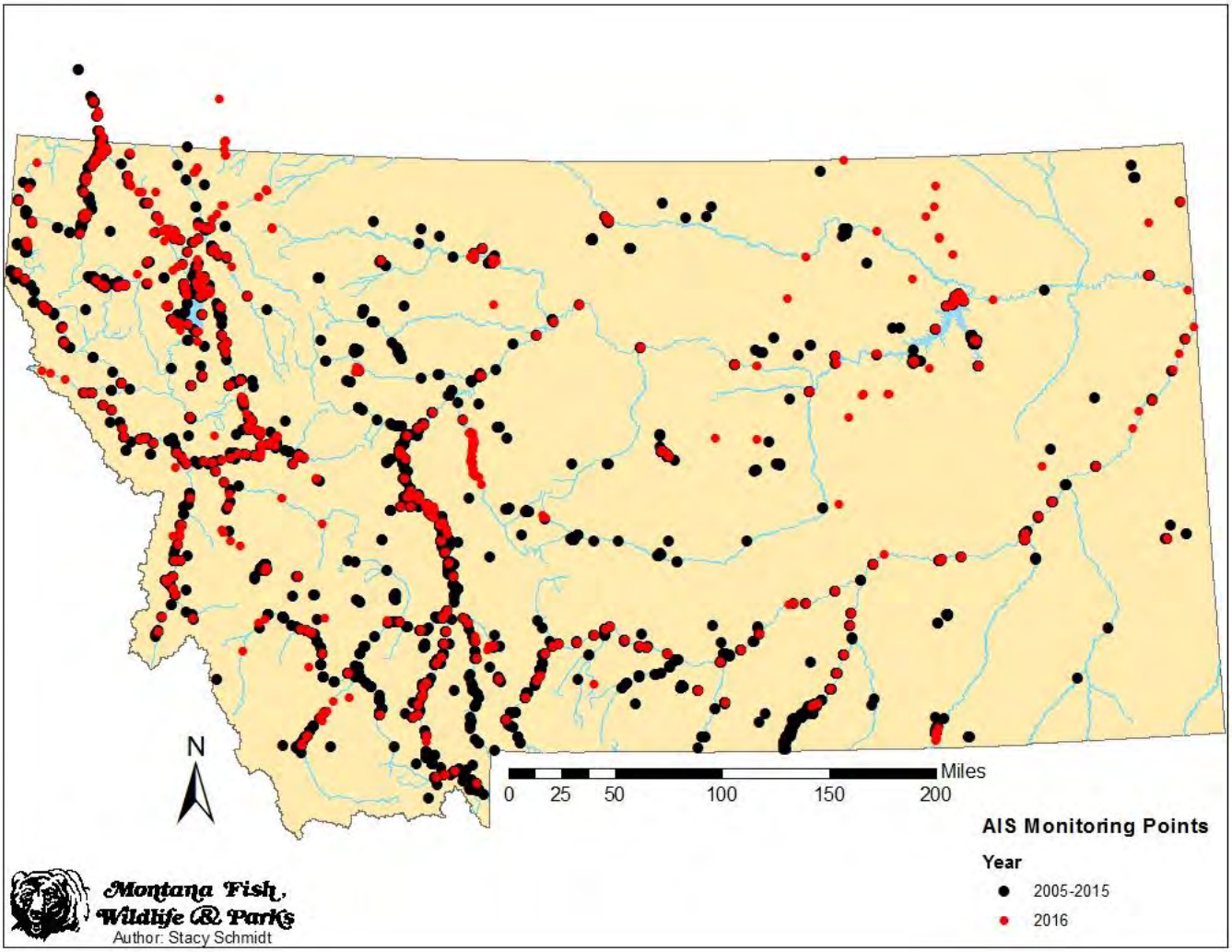
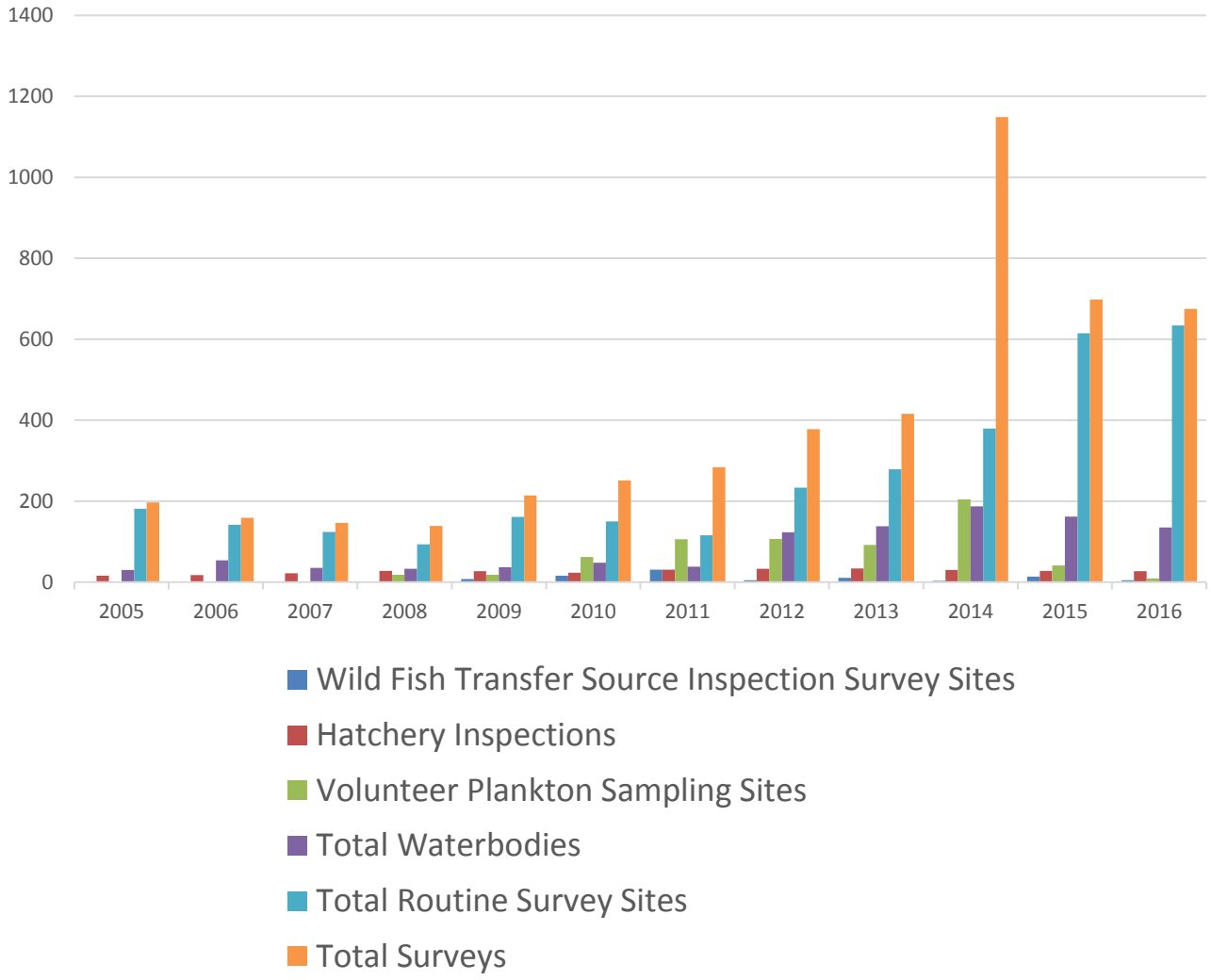


Figure 2 illustrates trends in AIS monitoring efforts over the past eleven years. Numerous variables contributed to the fluctuations in these data. Some examples of these variables include high and low water years, detections of AIS species within a season, and program funding. FWP's Aquatic Invasive Species program has been expanding since its inception and is an essential part of a comprehensive AIS management program. This expansion includes the monitoring aspect of the program as illustrated in the table below.

Figure 2: Annual AIS Monitoring (2005-2016)



IV. Aquatic Plant Sampling

FWP surveyed water bodies that were suspect to contain AIS, high risk, or locations needing confirmation of AIS. In addition, several locations were resurveyed to examine the dynamics and abundance of established AIS populations. In all, FWP crews surveyed 21 waterbodies. Table 1 shows the locations of FWP sampling for aquatic invasive plants. No new invasive plant populations were found though in 2016.

Table 1. 2016 Aquatic plant sampling locations

Water Body	County	Sampling Type	Sampling Days	Sampling Points	Findings
Bair Reservoir	Meagher	Point-Intercept	1	206	No AIS found
Beaverhead River	Beaverhead	Whole Reach Surveys	4	158	Curlyleaf pondweed
Bighole River	Beaverhead	Whole Reach Survey	7	826	No AIS found
Browns Lake	Powell	Point-Intercept	1	131	Fragrant waterlily
Bull Lake	Lincoln	Point-Intercept	3	155	No AIS found
Echo Lake	Flathead	Point-Intercept	3	371	No AIS found
Flathead Lake	Flathead	Point-Intercept	3	259	No AIS found
Hauser Lake	Lewis & Clark	Point-Intercept	5	544	Curlyleaf pondweed
Horseshoe Lake	Flathead	Point-Intercept	1	122	No AIS found
Hungry Horse Reservoir	Flathead	Point-Intercept	3	205	No AIS found
Jefferson River (Below Cardwell)	Jefferson/ Broadwater	Whole Reach Survey	3	894	Curlyleaf pondweed Eurasian watermilfoil
Jefferson Slough	Jefferson	Whole Reach Survey	2	417	Curlyleaf pondweed Eurasian watermilfoil begins above Mulligan Crossing
Lake Helena	Lewis & Clark	Point-Intercept	2	223	Curlyleaf pondweed
Lake Mary Ronan	Lake	Point-Intercept	2	250	Fragrant waterlily
Loon Lake	Flathead	Point-Intercept	1	49	Fragrant waterlily
Missouri River (Toston to Canyon Ferry Reservoir)	Broadwater	Whole Reach Survey	2	182	Curlyleaf pondweed Eurasian watermilfoil
Savage Lake	Lincoln	Point-Intercept	1	96	Fragrant waterlily
Swan Lake	Flathead	Point- Intercept	3	254	Fragrant waterlily
Tongue River Reservoir	Bighorn	Point-Intercept	3	318	No AIS found
Upsata Reservoir	Powell	Point-Intercept	1	62	Fragrant waterlily
Willow Creek Reservoir	Lewis & Clark	Point-Intercept	3	318	No AIS found
Yellowstone River (Gardiner to Reed Point)	Park/ Sweetgrass/ Stillwater	Whole Reach Survey	8	990	No AIS found

V. Aquatic Invasive Species Laboratory

The primary FWP Aquatic Invasive Species Laboratory is in Helena, MT. It was established in coordination with the Missouri River Basin Panel and the U.S. Fish and Wildlife Service to provide the service of early detection of Dreissenid mussels to those states. It currently processes plankton samples for New Mexico and the Missouri River Basin, including Kansas, Nebraska, Missouri, North Dakota, South Dakota, Wyoming, and Montana. It is in Montana's best interest to know what AIS may exist downstream and near its borders, and as such, samples are processed for partner states as an in-kind service. The base funding for this lab is provided by the U.S. Fish and Wildlife Service. Figures 3 and 4 illustrate the volume of samples handled by the lab each year. The lab has discovered new populations of *Dreissena spp.* veligers as well as *Corbicula sp.* (Asian clam) veligers for multiple downstream states. The lab undergoes routine quality control testing by other states and has participated in a community double-blind round robin study on the reliability of early detection methods (Frischer et al, 2011).

Figure 3: Dissecting scope using cross-polarized light microscopy in FWP AIS laboratory in Helena.

In 2016, Dreissenid veligers were found in samples collected at Tiber Reservoir (both in FWP samples collected in the summer and fall and one BOR sample collected in the summer). Samples suspect for Dreissenid larvae came from Canyon Ferry Reservoir and the Missouri River at York Island. An inconclusive sample for Dreissenid veligers came from the Milk River.

All Montana samples were completed as of December 16th. As an outcome of these findings, the lab outsourced some samples this year to get them done as quickly as possible. So, 76 Montana samples (primarily from west of the continental divide) were processed by the Colorado Parks and Wildlife lab run by Elizabeth Brown in Denver. **The Montana lab is currently processing out-of-state samples.** So far, for out-of-state samples (n=955), *Corbicula* veligers were found in 11 samples from 3 states and Dreissenid veligers were found in 2 samples from 2 states.

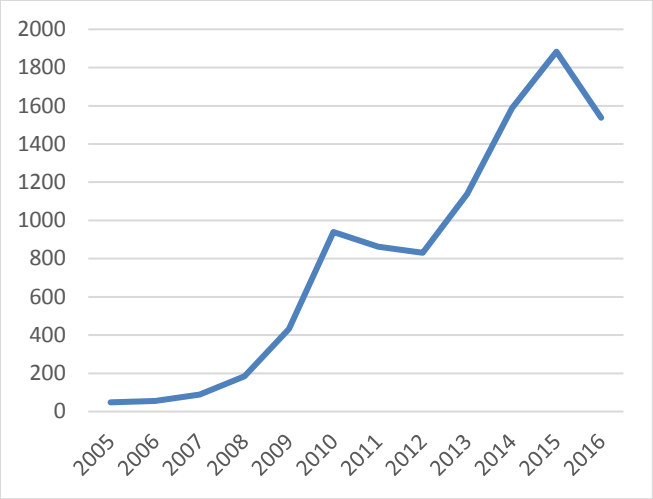


Figure 4: Number of samples processed by lab each year.

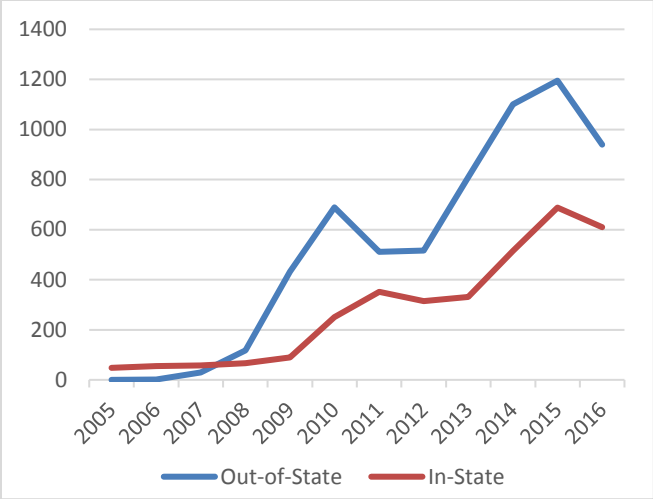


Figure 5: Number of plankton processed by year: in-state vs. out-of-state.

The AIS laboratory is currently over its capacity to process samples in a timely manner. Due to the increasing sample load each year, the timing for which samples are received and the increasing need for samples to be prioritized during the summer months, the AIS laboratory is currently taking measures to accommodate the higher sample load to get samples processed more efficiently. Starting in the winter of 2015, FWP began to train an existing permanent staff member in laboratory sample processing techniques. The newly established, secondary AIS lab is in Kalispell, MT. It takes two to three years for a lab technician to become proficient. For the 2016 season, the goal was to have this Kalispell-based satellite lab process Montana samples only while the primary, Helena-based lab would coordinate sample processing for all samples and process out-of-state samples. This was a proposed solution to the problem of increasing turn-around time for the lab's current sample load. This will not allow for additional samples. For the lab to take on additional samples, other measures will need to be taken.

In July 2016, the FWP AIS Laboratory manager met with the Missouri River Basin Panel members to discuss solutions to this dilemma and presented the program's ideas for improving turnaround time. The group decided that in 2016, the MT lab would not process any out-of-state samples that did not come from the Missouri River Basin and presented the initial plan to have the primary lab technician only process out-of-state samples and the newly trained, less experienced, lab technician in Kalispell to process MT samples. However, due to the primary lab technician's absence and/or significantly reduced hours from May through November and to the still high number of samples, the planned means to address the issues did not go as planned. The secondary lab technician sporadically assisted with sample

processing starting at the end of August due to other assigned duties (monitoring, watercraft decontamination and watercraft inspection station supervision).

VI. Mussel Response

Governor Steve Bullock issued an executive order November 30, 2016 declaring a statewide natural resource emergency for Montana water bodies due to the detection of invasive aquatic mussel larvae. The State of Montana's Mussel Response Team was formed to rapidly assess the extent and severity of the mussel incident impacting Montana's waterways. The team is working to develop a coordinated response and long-term strategy to mitigate economic and ecological damage. To accomplish this, the team is collecting data and information to make informed decisions, contain and control affected areas, and develop procedures to prevent future contamination risks. Providing the public with accurate and timely information is a priority of the response team. In early 2017, this information will be brought to the governor's office and legislators to ensure Montana is doing all possible to address and control this new threat and continue with its education and outreach, early detection and monitoring, and control and containment.

A. Laboratory Efforts

On October 17th, the U.S. Bureau of Reclamation lab in Denver reported to FWP that it had found half of a suspected Dreissenid veliger shell in a sample collected from Tiber Reservoir in mid-August. Further tests (PCR and gene sequencing) on this organism resulted in the organism being identified as a quagga mussel (*Dreissena bugensis*). This detection prompted the FWP lab to prioritize all Tiber samples that FWP had collected primarily in mid-July. There were nine samples total and three of those samples yielded suspect organisms. It is the protocol of the FWP lab to only process half of each sample so that it can retain the other half to be sent to independent labs, if necessary, for verification. FWP then prioritized other high-risk waterbodies in Montana which led to the subsequent suspect detections in Canyon Ferry Reservoir (collected 8/16, processed 10/26), the Missouri River at York Island (collected 7/21, processed 11/21) and the inconclusive detection on the Milk River (collected 7/28, processed 11/18).

As per FWP laboratory protocol, the photos of all suspect organisms were shared with a minimum of 2 independent labs or experts. In every case, Dreissenids could not be ruled out. Nor could any expert identify any other possible species that the organisms might be with any degree of certainty.

In total, the remaining halves of the nine Tiber Reservoir samples along with the remaining halves of the nine samples from Canyon Ferry Reservoir collected in mostly mid-July and mid-August were sent to an independent lab in California for verification using microscopy and

PCR, when applicable. The suspect Missouri River and inconclusive Milk samples were also sent to the same lab for verification. One suspect sample from Tiber Reservoir collected during the fall resampling event was also sent along with the summer Canyon Ferry samples. The results from the California lab yielded only one suspect veliger in one of the summer samples collected from Tiber Reservoir. PCR testing on that organism yielded no amplification.

Figure 6: FWP fisheries biologist and technician, Dave Yerk and Dan Frazer, inspecting a structure on Tiber Reservoir for settled

B. Field Efforts

When FWP learned of the discovery by the BOR and after FWP samples also came up as suspect, the FWP AIS program immediately started working with Helena management staff and FWP Region 4 staff to make plans to resample the reservoir during the week of October 24th. One FWP AIS program staff went out with the Tiber Reservoir Fisheries Biologist and Fisheries Technician to resample the reservoir for both adult and larval mussels. This team utilized existing data on drawdown levels over the last few years, water quality data and the biologist's local knowledge of the hydrology of the system and habitat to sample the most likely areas of infestation. This sampling event took 3 days and included the entire reservoir (all major boat ramps and other areas) as well as the Marias River downstream of the dam. The team felt the only major gap in sampling was where the rockiest shoreline existed and couldn't be thoroughly searched by three people These sites included some access points, the west dike, turner point, and the dam. Plans were made to address this sampling gap in the future. All the docks in the reservoir are pulled out of the water during the winter months. See Appendix B for a map of the sampling events that took place on Tiber Reservoir.

Figure 7: FWP fisheries technician, Adam Strainer, conducting a shoreline search for settled mussels near a boat ramp on Canyon Ferry Reservoir.

During the first week of November, the same effort was applied to Canyon Ferry Reservoir using two AIS program staff as well as the fisheries biologist and technician for the reservoir. Similar adult and larval resampling occurred at the most high-risk sites. Canyon Ferry was still undergoing some algae blooms which impeded plankton sampling in some areas of the reservoir. There is also a higher quantity of suitable Dreissenid substrate in Canyon Ferry. Canyon Ferry also has much higher residential property along the shoreline and therefore many more docks and structures in the water during the summer. This time, the team felt the highest gap in sampling were the larger marinas with slips and docks still in the water as well as these residential areas. See Appendix C for a map of the sampling events that took place on Canyon Ferry Reservoir.

Figure 8: Alberta mussel sniffing dog team, Cindy Sawchuk and Hilo, searching for mussels along the west dike of Tiber Reservoir.

The Department of Natural Resources and Conservation (DNRC) and FWP worked together during early November to make plans to deploy mussel sniffing dogs at both reservoirs. Two dog teams were brought in from western Montana and one dog team from Alberta to start working on Tiber Reservoir on November 11th. The teams worked at Canyon Ferry Reservoir on the 12th-13th. At both reservoirs, the dogs alerted to indicate the presence of mussels, but no adult mussels were found at either location. All dogs alerted to control mussels placed on substrate. Two dogs alerted to the same location on a dock at the VFW boat ramp at Tiber Reservoir that had been pulled from the water. No mussels were found that day, but there were interior structures on the dock that could not be accessed without taking it apart. The FWP Tiber Fisheries Biologist worked with the BOR manager for the Marias-Milk Rivers

Figure 9: FWP AIS plant specialist, Craig McLane, searching for adult mussels at the Silos Marina on Canyon Ferry Reservoir.

Division to tear apart the rollers of that dock and further search for mussels on December 16th and no mussels were found.

The next step was to address the gaps in sampling that still existed where dogs alerted and/or there were larval mussel detections or suspect detections where areas could not be thoroughly searched from shore. Divers and snorkeling were on the list of resources from the start. The AIS program staff has experienced snorkelers and divers. The U.S. Fish and Wildlife Service Dive team had been contacted early on to make sure a team would be available, if needed. First, the only gap at Tiber Reservoir that remained after the dog searches was the dam. The dog team was not able to search the face of the dam due to the instability of the substrate. No larval indications of mussels occurred at the dam, though it seemed to be the bottleneck point of the system and a likely area for mussel infestation. However, due to the cold temperatures, instability of the substrate (which consisted mostly of large boulder rip-rap), and the deteriorating weather conditions, it was decided by both the response team and the FWS dive team that diving at Tiber Reservoir should be postponed until after ice-off. Additionally, finding adult mussels at the dam by this method would be extremely difficult. Until larval sampling indicates a presence there, divers will likely be utilized elsewhere.

Figure 10: FWS diver, Nicole Prescott, searching for mussels at Canyon Ferry Reservoir.

It was decided that the FWS divers would be best utilized to address the gaps at the larger marinas at Canyon Ferry Reservoir (Yacht Basin Marina and Silos Marina). FWP worked

in conjunction with the dive team and the marina owners to coordinate this effort. On November 15th, FWP AIS program staff went out to snorkel at Silos Marina to search for adult mussels, to gauge water conditions to report to the FWS dive team so they could be best prepared for their planned effort the following week, and to collect scrape samples to be analyzed in the lab. Scrape samples were processed by the Helena FWP AIS lab on November 16th, and no mussels were detected.

On November 21st and 22nd, two U.S. FWS dive teams conducted thorough searches on the docks and slips and watercraft remaining in the water at both Silos Marina and Yacht Basin Marina. No mussels were detected and the dive team felt their probability of detection was very high.

Further sampling was planned for the winter to utilize eDNA. However, the incident command team made the decision to postpone this effort until after ice-off due to various limitations. The Montana Mussel Incident Command Team has made the decision to suspend additional sampling and testing using eDNA. After consultation with independent scientists and other AIS experts, the incident command team concluded that eDNA testing is unlikely to garner enough additional information for informed decision making during the emergency response timeframe and therefore is not a good use of emergency funding now. This method of sampling and testing will be considered in the future.

Sampling areas that have resulted in positive or suspect samples for Dreissenid larvae will resume and intensify beginning in the spring of 2017.

C. Planning Efforts

On November 7th, the interagency team held its first joint meeting and established a response team and basic communication plan. On November 9th, stakeholders were notified of results in Tiber and Canyon Ferry Reservoirs just prior to the release of the first press release.

The Mussel Response Incident Command Team is currently working on the emergency response because of these findings and FWP is involved in that response.

VII. Future Needs

Statewide monitoring efforts by FWP, private sector and government entities are continually improving and expanding. These efforts are critical to the early detection and monitoring of invasive species, and are an important aspect of the AIS program and statewide AIS Management Plan. While these efforts do not guarantee discovery of all AIS species as they are introduced, they do significantly increase the potential to discover new populations before they become established or spread beyond their current boundaries. Limiting the establishment or spread of AIS allows for research to be conducted into control and

eradication methods, and allows for greater efficiency in monitoring and early detection methods. These advances will ultimately save the state time and money protecting its aquatic resources and infrastructure.

Due to the newly detected larval mussels in the state. FWP's AIS program will need to change drastically and adjust to this changing landscape of AIS within the state. Historically, the program has efficiently utilized its allocated resources to follow the governor's blueprint and address the needs of the state with limited resources. Now efforts will need to be increased without shifting the focus of the program from all taxa to only mussels.

Table 2: 2016 FWP AIS Monitoring Locations

Waterbody	# of Sites	Macrophyte Sampling	Invertebrate Sampling	Plankton Sampling	Type	AIS Occurrences
Afterbay Reservoir	1	Yes	Yes	Yes	Wild	
Bair Reservoir*	3	Yes	Yes	Yes	Wild	
Base Pond FAS	1	Yes	Yes	Yes	Wild	
Beaver Lake	1	Yes	Yes	Yes	Wild	
Beaverhead River*	7	Yes	Yes	Yes	Wild	NZMS
Big Hole River*	11	Yes	Yes	Yes	Wild	
Big Reservoir	1	Yes	Yes	Yes	Wild	
Big Sky Lake	1	No	No	Yes	Plankton	
Big Spring Creek	3	Yes	Yes	Yes	Hatchery	
Big Spring Creek Trout Hatchery	2	Yes	Yes	Yes	Hatchery	
Bighorn Lake	1	Yes	Yes	Yes	Wild	
Bighorn River	6	Yes	Yes	Yes	Wild	
Bitterroot Fish Hatchery	1	Yes	Yes	Yes	Hatchery	
Bitterroot River	8	Yes	Yes	Yes	Wild	CLPW
Blackfoot River	12	Yes	Yes	Yes	Wild	
Bluewater Creek	10	Yes	Yes	Yes	Hatchery	NZMS
Brownes Lake (Beaverhead Co.)	1	Yes	Yes	Yes	Wild	
Browns Lake (Powell Co.)*	2	Yes	Yes	Yes	Wild	
Brush Lake	1	No	No	Yes	Plankton	
Bull Lake*	4	Yes	Yes	Yes	Wild	
Cabinet Gorge Reservoir	2	Yes	Yes	Yes	Wild	CLPW, EWM
Camp Creek	1	No	No	Yes	Plankton	
Canyon Ferry Reservoir	31	Yes	Yes	Yes	Wild/Troubleshooting	Suspect Dreissenid Larvae, CLPW
Clark Canyon Reservoir	1	No	No	Yes	Plankton	
Clark Fork River	19	Yes	Yes	Yes	Wild	CLPW, EWM
Clearwater River	3	No	No	Yes	Plankton	
Cottonwood Creek	2	Yes	Yes	Yes	Wild	
Creston National Fish Hatchery	1	Yes	Yes	Yes	Hatchery	
Crystal Lakes	1	Yes	Yes	Yes	Hatchery	
Darlington Ditch	1	Yes	Yes	Yes	Wild	NZMS
Dredge Cuts, Fort Peck	1	Yes	Yes	Yes	Wild	
Echo Lake*	5	Yes	Yes	Yes	Wild	

Waterbody	# of Sites	Macrophyte Sampling	Invertebrate Sampling	Plankton Sampling	Type	AIS Occurrences
Ennis Lake	2	Yes	Yes	Yes	Wild	
Ennis National Fish Hatchery	1	Yes	Yes	Yes	Hatchery	
Flathead Lake*	14	Yes	Yes	Yes	Wild	Flowering Rush
Flathead Lake Salmon Hatchery	1	Yes	Yes	Yes	Hatchery	
Flathead River	6	Yes	Yes	Yes	Wild	
Fort Peck Hatchery	1	Yes	Yes	Yes	Wild	
Fort Peck Reservoir	14	Yes	Yes	Yes	Wild	CLPW, EWM
Fresno Reservoir	3	Yes	Yes	Yes	Wild	
Gallatin River	4	Yes	Yes	Yes	Wild	
Georgetown Lake	4	Yes	Yes	Yes	Wild	
Giant Springs (Roe River)	1	Yes	Yes	Yes	Hatchery	
Grants Reservoir	1	Yes	Yes	Yes	WFT	
Harbor Pond	1	Yes	Yes	Yes	Wild	
Harpers Lake	1	No	No	Yes	Plankton	
Harriman Trout Co.	1	Yes	Yes	Yes	Hatchery	
Hauser Lake*	8	Yes	Yes	Yes	Wild	NZMS, CLPW
Hebgen Lake	1	No	No	Yes	Plankton	
Helena Valley Regulating Reservoir	1	Yes	Yes	Yes	Wild	
Holland Lake	1	No	No	Yes	Plankton	
Holter Lake	3	Yes	Yes	Yes	Wild	CLPW
Horseshoe Lake*	2	Yes	Yes	Yes	Wild	
Hungry Horse Reservoir*	9	Yes	Yes	Yes	Wild	
Hyalite Reservoir	1	Yes	Yes	Yes	Wild	
Jefferson River*	3	Yes	Yes	Yes	Wild	
Jefferson slough*	1	No	No	Yes	Plankton	
Jocko River Trout Hatchery	1	Yes	Yes	Yes	Hatchery	
Kootenai River	1	No	No	Yes	Plankton	
Lake Alva	1	No	No	Yes	Plankton	
Lake Como	1	Yes	Yes	Yes	Wild	
Lake Five	1	Yes	Yes	Yes	Wild	
Lake Frances	1	Yes	Yes	Yes	Wild	
Lake Helena*	2	Yes	Yes	Yes	Wild	
Lake Inez	1	No	No	Yes	Wild	Fragrant Waterlily
Lake Koocanusa	26	No	No	Yes	Plankton	
Lake Mary Ronan*	2	Yes	Yes	Yes	Wild	

Waterbody	# of Sites	Macrophyte Sampling	Invertebrate Sampling	Plankton Sampling	Type	AIS Occurrences
Langen (Forsman) Reservoir	1	Yes	Yes	Yes	Wild	
Lindbergh Lake	1	Yes	Yes	Yes	Plankton	
Little McGregor Lake	1	Yes	Yes	Yes	Wild	
Little Warm Reservoir	1	Yes	Yes	Yes	Wild	
Loon Lake*	2	Yes	Yes	Yes	Wild	
Lower Stillwater Lake	1	Yes	Yes	Yes	Wild	
Lower Thompson Lake	1	Yes	Yes	Yes	Wild	
Luloff's	1	Yes	Yes	Yes	Hatchery	
Madison River	5	Yes	Yes	Yes	Wild	
Marias River	5	Yes	Yes	Yes	Wild	CLPW
McGregor Lake	1	Yes	Yes	Yes	Wild	
McGregor Lake (west)	1	Yes	Yes	Yes	Wild	
Medicine Lake	1	Yes	Yes	Yes	Wild	
Middle Thompson Lake	1	Yes	Yes	Yes	Wild	
Miles City Fish Hatchery	2	Yes	Yes	Yes	Hatchery	
Milk River	3	Yes	Yes	Yes	Wild	Inconclusive for larval Dreissenid
Missouri River*	23	Yes	Yes	Yes	Wild	NZMS, CLPW, EWM (below Fort Peck)
Mitchell Slough (Bitterroot River)	2	Yes	Yes	Yes	Wild	
Murray Springs Hatchery	1	Yes	Yes	Yes	Hatchery	
Nelson Reservoir	1	No	No	Yes	Plankton	
Nevada Creek	1	Yes	Yes	Yes	Wild	
Norton Creek	1	Yes	Yes	No	Wild	
Noxon Reservoir	3	Yes	Yes	Yes	Wild	EWM
O'Juel Lake	1	Yes	Yes	Yes	Wild	
Painted Rocks Reservoir	1	Yes	Yes	Yes	Wild	
Paulo Reservoir	1	Yes	Yes	Yes	Wild	
Payola Reservoir	1	Yes	Yes	Yes	Wild	
Pipestone Creek	1	Yes	Yes	No	Wild	
Placid Lake	1	No	No	Yes	Plankton	
Prickly Pear Creek	1	Yes	Yes	Yes	Wild	
Rainbow Springs Trout Farm	1	Yes	Yes	Yes	Hatchery	
Rainy Lake	1	No	No	Yes	Plankton	
Rock Creek	5	Yes	Yes	Yes	Plankton	
Rogers Lake	1	Yes	Yes	Yes	Wild	
Rose Creek	1	Yes	Yes	Yes	Hatchery	

Waterbody	# of Sites	Macrophyte Sampling	Invertebrate Sampling	Plankton Sampling	Type	AIS Occurrences
Salmon Lake	1	No	No	Yes	Wild	Fragrant Waterlily
Savage Lake*	2	Yes	Yes	Yes	Wild	
Seeley Lake	1	No	No	Yes	Plankton	Fragrant Waterlily
Sekokini	1	Yes	Yes	Yes	Hatchery	
Smith River	42	Yes	Yes	Yes	Wild	CLPW
Sophie Lake	1	No	No	Yes	Plankton	
South Sandstone Reservoir	1	Yes	Yes	Yes	WFT	
Spotted Eagle Lake	1	Yes	Yes	Yes	Wild	
St. Regis River	4	Yes	Yes	Yes	Wild	
Stillwater River	2	Yes	Yes	Yes	Wild	
Swan Lake*	3	Yes	Yes	Yes	Wild	
Swan River	8	Yes	Yes	Yes	Wild	
Three Forks Ponds	3	Yes	Yes	Yes	Wild	
Tiber Reservoir	18	Yes	Yes	Yes	Wild/Troubleshooting	Larval Dreissenid, CLPW
Tongue River Reservoir*	6	Yes	Yes	Yes	Wild	
Upper Holter Lake	1	Yes	Yes	Yes	Wild	NZMS
Upper Stillwater Lake	1	Yes	Yes	Yes	Wild	
Upper Thompson Lake	1	Yes	Yes	Yes	Wild	
Upsata Lake*	2	Yes	Yes	Yes	Wild	
Valley Reservoir VR009	1	Yes	Yes	Yes	Wild	
Van Lake	1	No	No	Yes	Plankton	
Wade Lake	1	No	No	Yes	Plankton	
Ward Dam	1	Yes	Yes	Yes	Wild	
Washoe	1	Yes	Yes	Yes	Hatchery	
West Fork Bitterroot River	1	Yes	Yes	Yes	Hatchery	
Westslope Trout Co.	1	Yes	Yes	Yes	Hatchery	
Whitefish Lake	2	No	No	Yes	Plankton	
Whitefish River	1	No	No	Yes	Plankton	
Whitetail Creek	1	No	No	Yes	Plankton	
Willow Creek Reservoir*	5	Yes	Yes	Yes	Wild	
Yaak River	3	No	No	Yes	Plankton	
Yellowstone River*	37	Yes	Yes	Yes	Wild	
Yellowstone River Trout Hatchery	1	Yes	Yes	Yes	Hatchery	

* Indicates locations where more comprehensive macrophyte surveys were conducted. See Appendix A.

VIII. Literature Cited

Frischer, M.E., Nierzwicki-Bauer, S.A., Kelly, K.L. 2011. Reliability of Early Detection of *Dreissena* spp. Larvae by Cross Polarized Light Microscopy, Image Flow Cytometry, and Polymerase Chain Reaction Assays: Results of a Community Double-Blind Round Robin Study (Round Robin Study Phase II). http://www.musselmonitoring.com/Reports/RRII%20Final%20Report%20(2010).pdf.

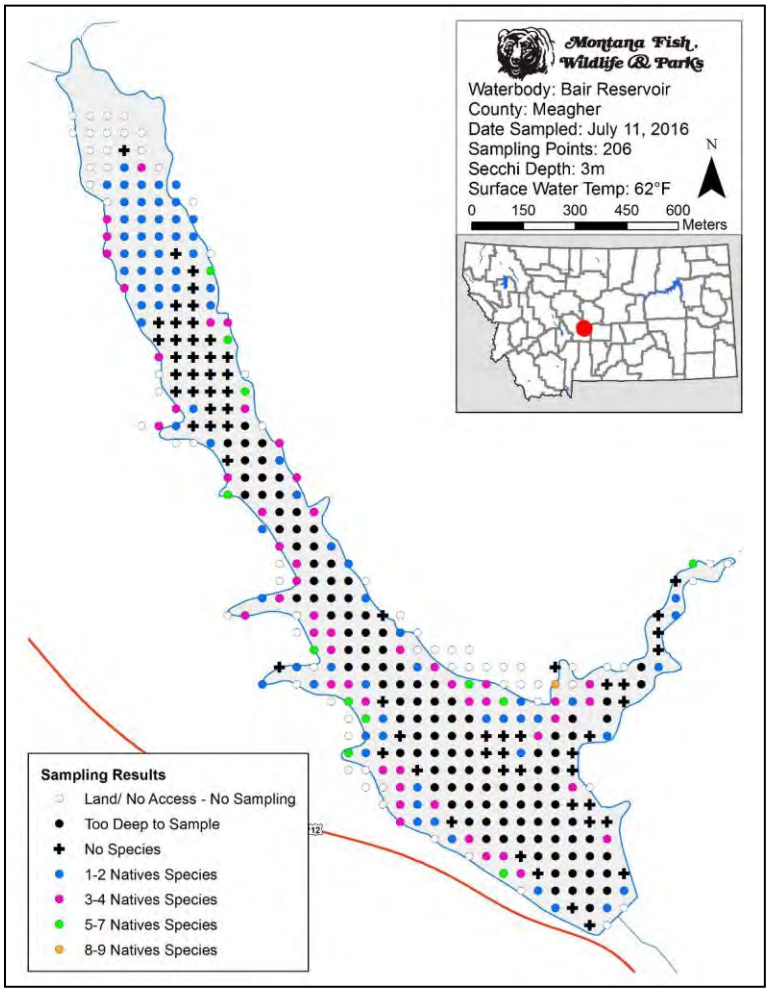
Appendix A. Results of Aquatic Plant Surveys

This appendix contains details of plant sampling within the list water bodies. Plant locations and species frequency (based on all sample points within the water body) are noted for each water body surveyed.

Table of Contents

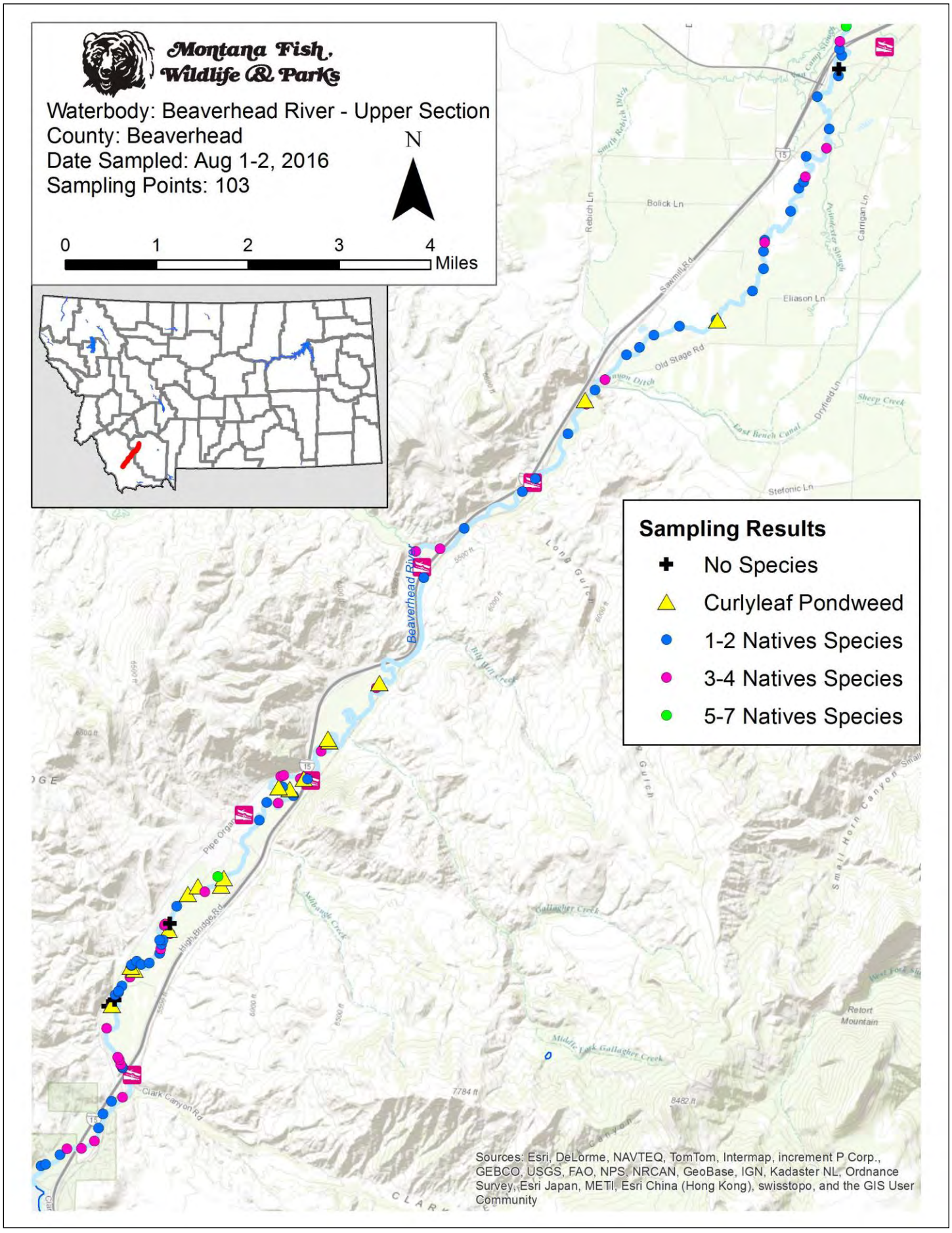
1. Bair Reservoir

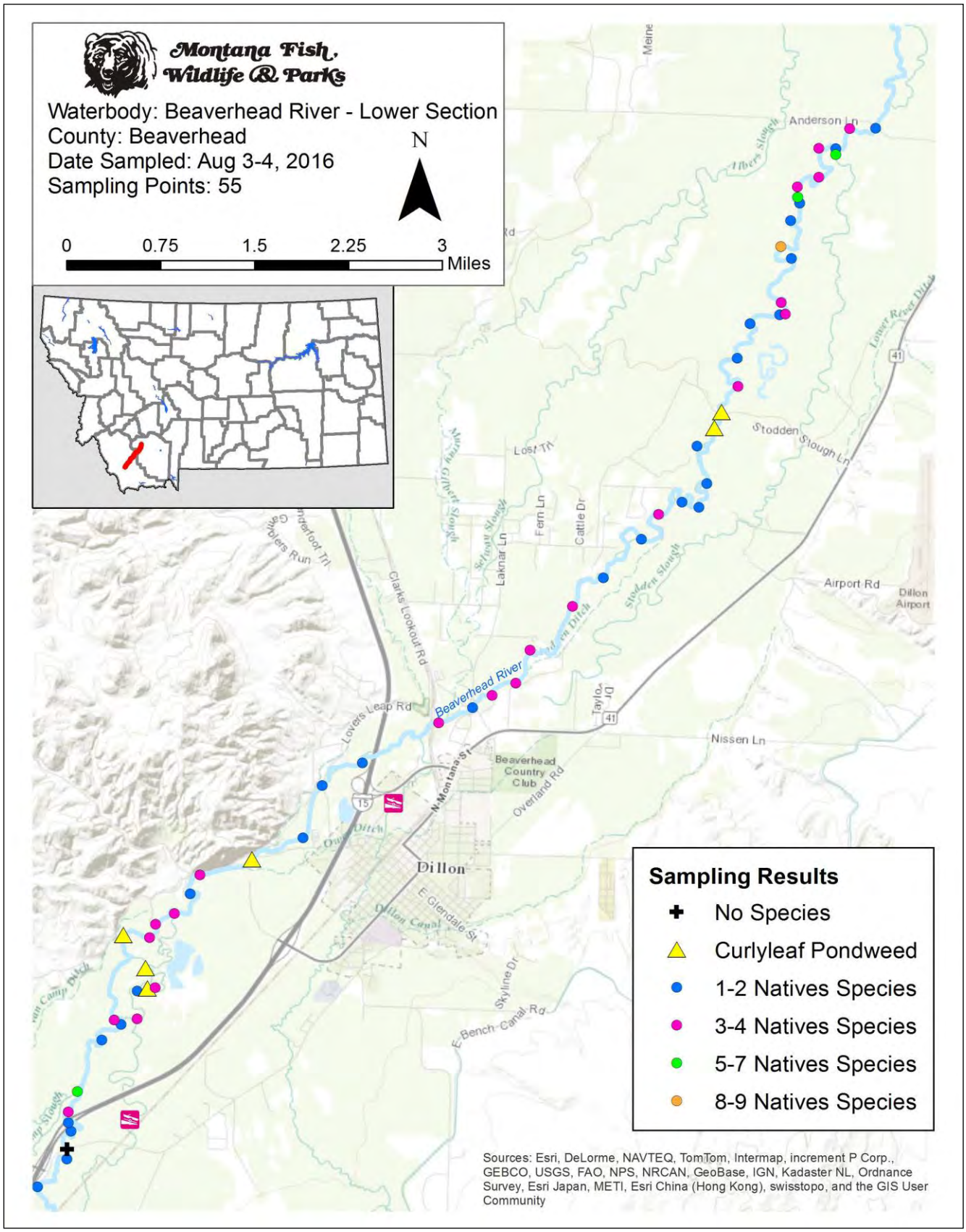
Bair Reservoir	n=206		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	63	30.6%
Chara spp.	*Chara spp.*	71	34.5%
Common water moss	*Fontinalis antipyretica*	71	34.5%
Autumnal water-starwort	*Callitriche hermaphroditica*	63	30.6%
Leafy pondweed	*Potamogeton foliosus*	43	20.9%
Slender leaved pondweed	*Potamogeton filiformis*	41	19.9%
Mare's tail	*Hippuris vulgaris*	36	17.5%
White waterbuttercup	*Ranunculus aquatilis*	25	12.1%
Narrowleaf water-plantain	*Alisma gramineum*	8	3.9%
Nitella spp.	*Nitella spp.*	1	0.5%



2. Beaverhead River

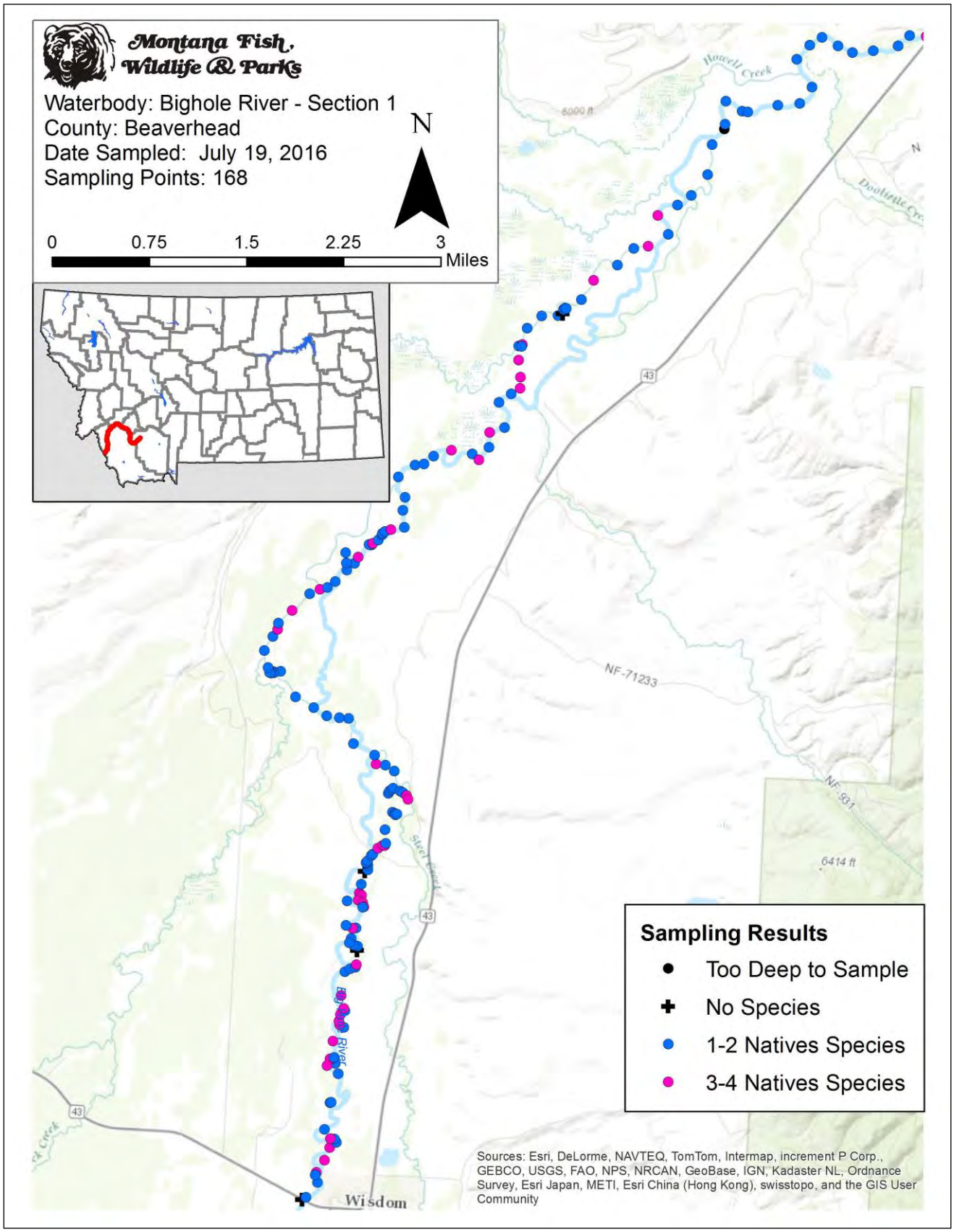
Beaverhead River	**n=158**		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	4	2.5%
Slender leaved pondweed	*Potamogeton filiformis*	137	86.7%
Horned pondweed	*Zannichellia palustris*	76	48.1%
White waterbuttercup	*Ranunculus aquatilis*	61	38.6%
Chara spp.	*Chara spp.*	30	19.0%
Curlyleaf pondweed	*Potamogeton crispus*	22	13.9%
Unknown	*Unknown*	20	12.7%
Leafy pondweed	*Potamogeton foliosus*	19	12.0%
Duckweed	*Lemna spp.*	10	6.3%
Northern watermilfoil	*Myriophyllum sibiricum*	7	4.4%
Canada waterweed	*Elodea canadensis*	6	3.8%
Common arrowhead	*Sagittaria latifolia*	4	2.5%
Mare's tail	*Hippuris vulgaris*	3	1.9%
Bulrush spp	*Scirpus spp.*	2	1.3%
Common bladderwort	*Utricularia vulgaris*	2	1.3%
Common water moss	*Fontinalis antipyretica*	2	1.3%

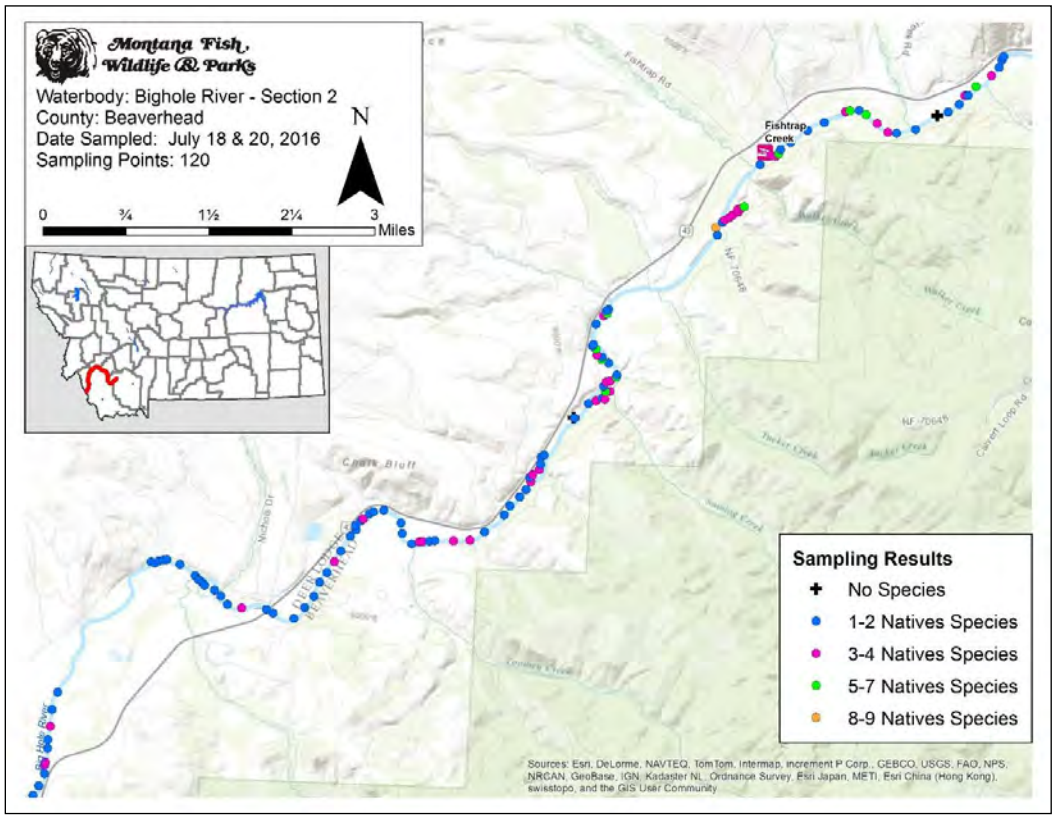

Montana Fish, Wildlife & Parks
Waterbody: Beaverhead River - Upper Section
County: Beaverhead
Date Sampled: Aug 1-2, 2016
Sampling Points: 103
N
0 1 2 3 4
Miles
Sampling Results
No Species
Curlyleaf Pondweed
1-2 Natives Species
3-4 Natives Species
5-7 Natives Species
Beaverhead River
Bolick Ln
Sawmill Rd
Eliason Ln
Old Stage Rd
East Bench Canal
Stefonic Ln
Pipe Organ
High Bridge Rd
Clark Canyon Rd
Gallagher Creek
Middle Fork Gallagher Creek
Retort Mountain
Small Horn Canyon
7784 ft
8482 ft
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

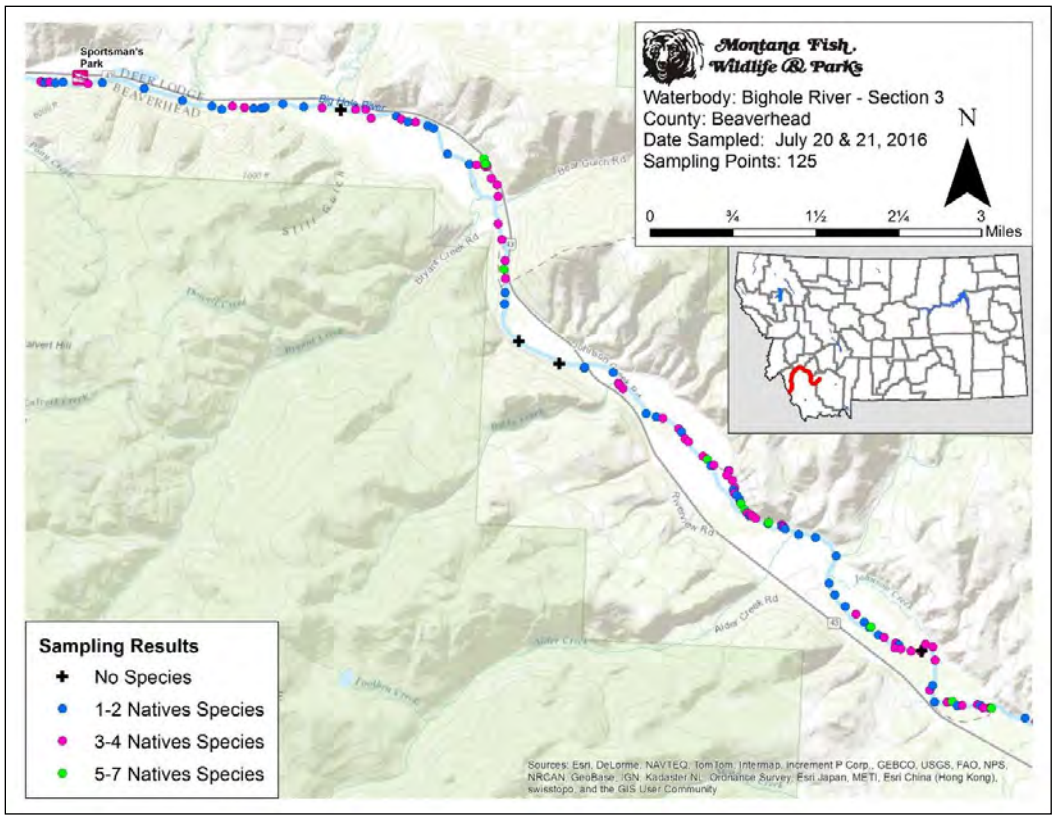

Montana Fish, Wildlife & Parks
Waterbody: Beaverhead River - Lower Section
County: Beaverhead
Date Sampled: Aug 3-4, 2016
Sampling Points: 55
N
0 0.75 1.5 2.25 3
Miles
Sampling Results
No Species
Curlyleaf Pondweed
1-2 Natives Species
3-4 Natives Species
5-7 Natives Species
8-9 Natives Species
Beaverhead River
Dillon
Anderson Ln
Stodden Slough Ln
Lower River Ditch
Airport Rd
Dillon Airport
Nissen Ln
Lovers Leap Rd
Clarks Lookout Rd
Lakrar Ln
Fern Ln
Cattle Dr
Lost Trl
Taylor Dr
N Montana St
Beaverhead Country Club
Overland Rd
E Glendale St
Dillon Canal
Skyline Dr
E Bench Canal Rd
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

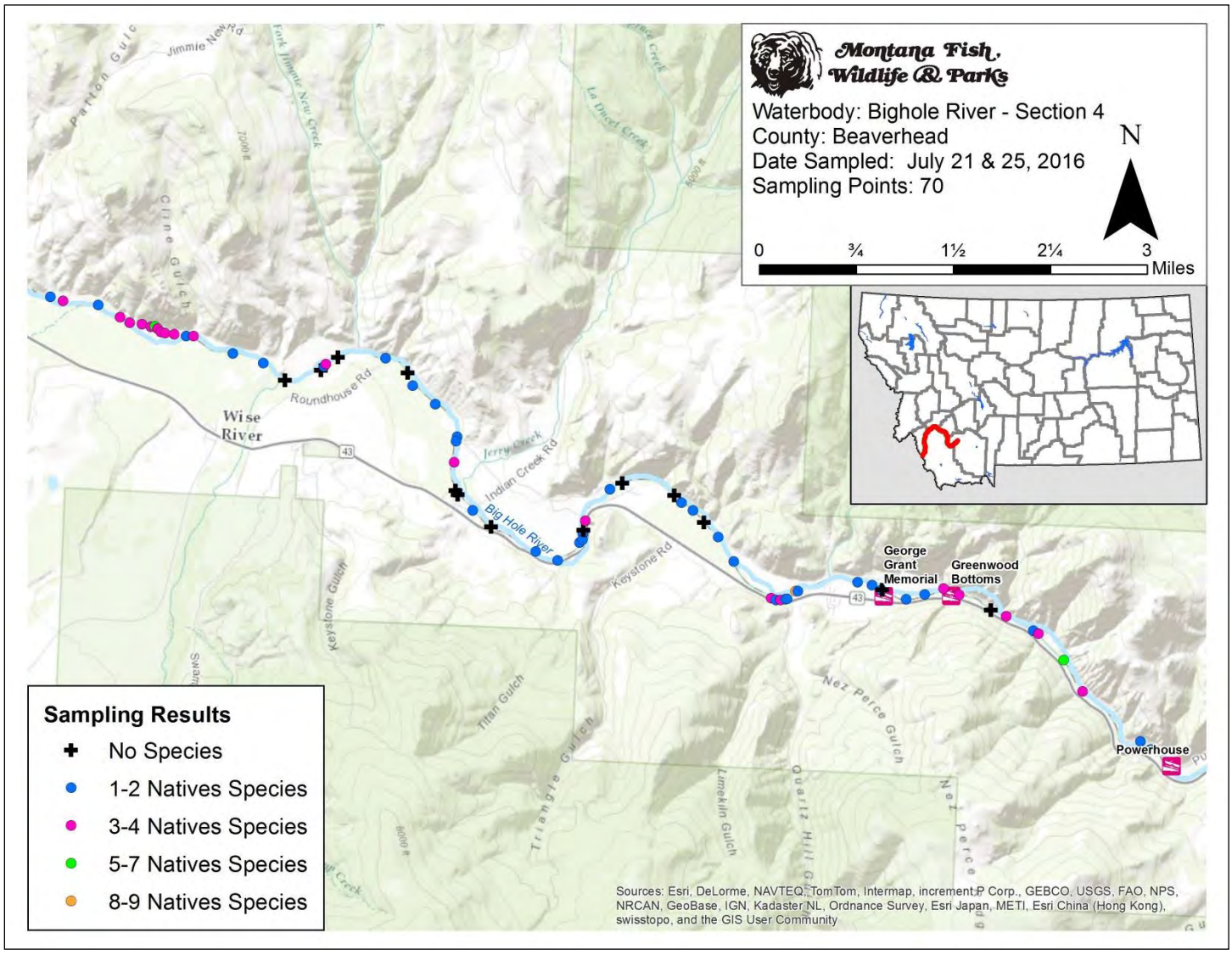
3. Bighole River

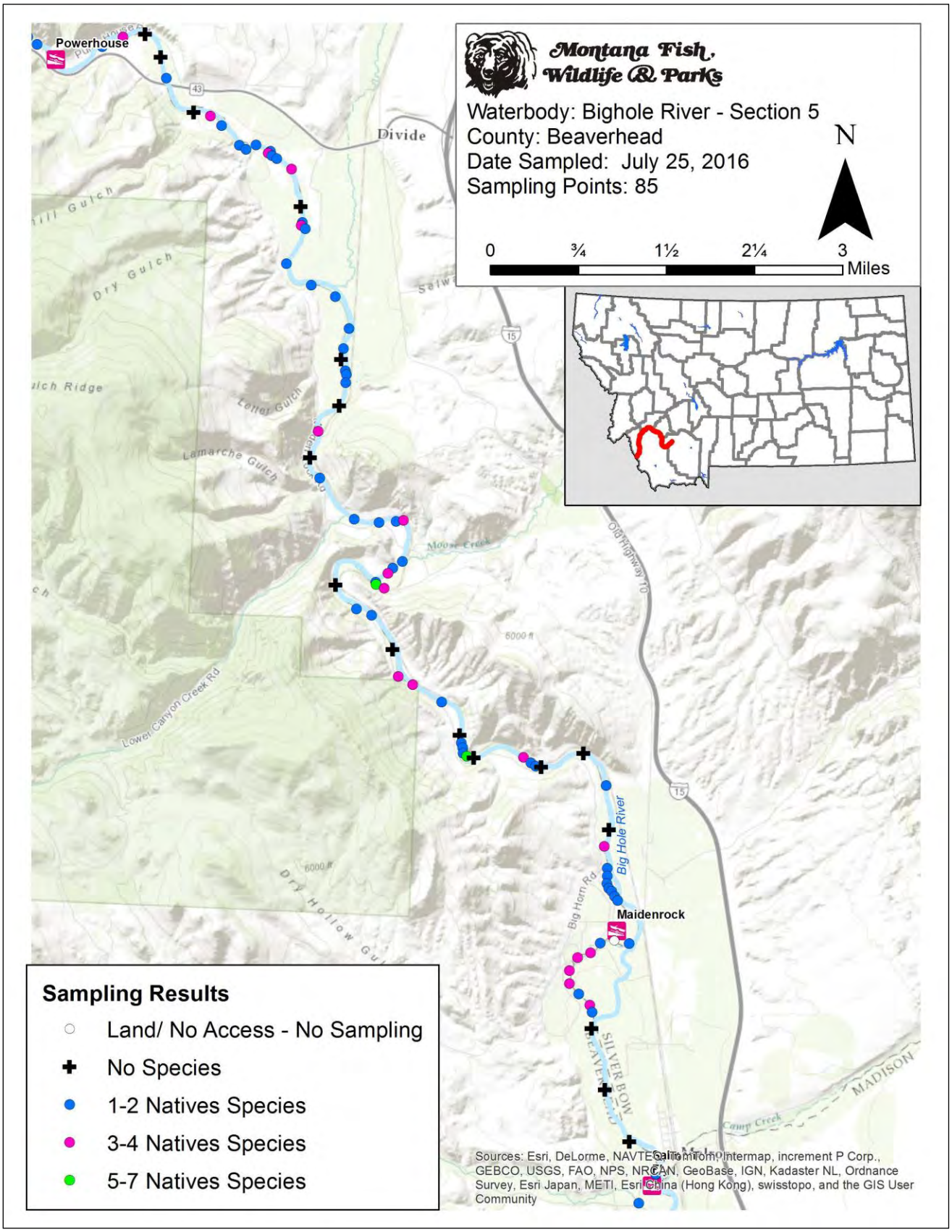
Bighole River	**n=826**		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	64	7.7%
White waterbuttercup	*Ranunculus aquatilis*	551	66.7%
Canada waterweed	*Elodea canadensis*	350	42.4%
White-stemmed pondweed	*Potamogeton praelongus*	225	27.2%
Slender leaved pondweed	*Potamogeton filiformis*	196	23.7%
Bulrush spp	*Scirpus spp.*	110	13.3%
Potamogeton Species	*Potamogeton spp*	93	11.3%
Leafy pondweed	*Potamogeton foliosus*	82	9.9%
Common water moss	*Fontinalis antipyretica*	56	6.8%
Duckweed	*Lemna spp.*	23	2.8%
Water smartweed	*Polygonum amphibium*	22	2.7%
Common arrowhead	*Sagittaria latifolia*	18	2.2%
Juncus Spp	*Juncus spp.*	11	1.3%
Mare's tail	*Hippuris vulgaris*	7	0.8%
Needle spikerush	*Eleocharis acicularis*	7	0.8%
Coontail	*Ceratophyllum demersum*	6	0.7%
Northern watermilfoil	*Myriophyllum sibiricum*	5	0.6%
Richardson's pondweed	*Potamogeton richardsonii*	4	0.5%
Chara spp.	*Chara spp.*	3	0.4%
Nitella spp.	*Nitella spp.*	2	0.2%
Common bladderwort	*Utricularia vulgaris*	1	0.1%
Floating-leaved pondweed	*Potamogeton natans*	1	0.1%

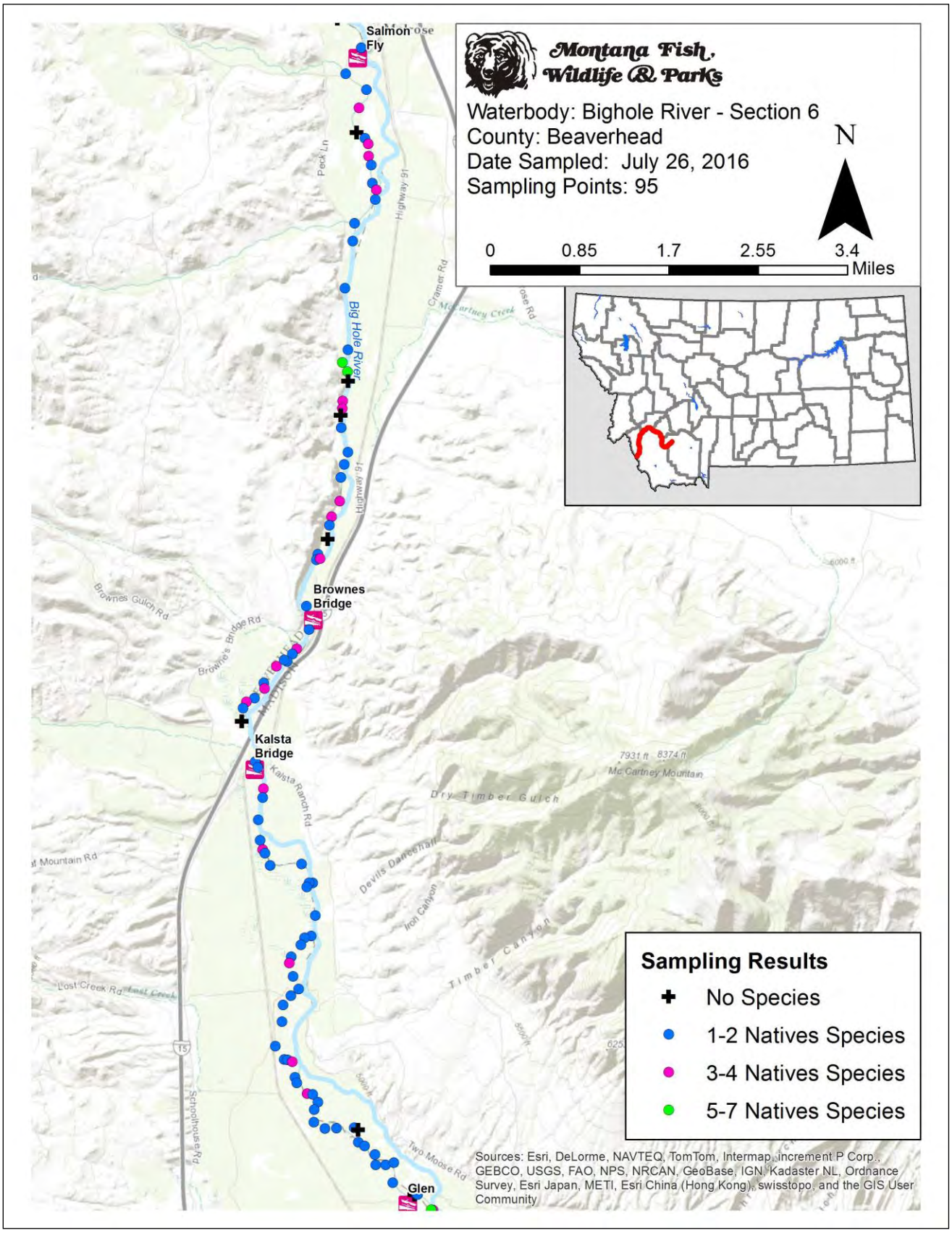

Montana Fish, Wildlife & Parks
Waterbody: Bighole River - Section 1
County: Beaverhead
Date Sampled: July 19, 2016
Sampling Points: 168
N
0 0.75 1.5 2.25 3
Miles
Howell Creek
6000 ft
NF-71233
NF-931
6414 ft
Sheep Creek
Big Hole River
43
Wisdom
Sampling Results
Too Deep to Sample
No Species
1-2 Natives Species
3-4 Natives Species
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

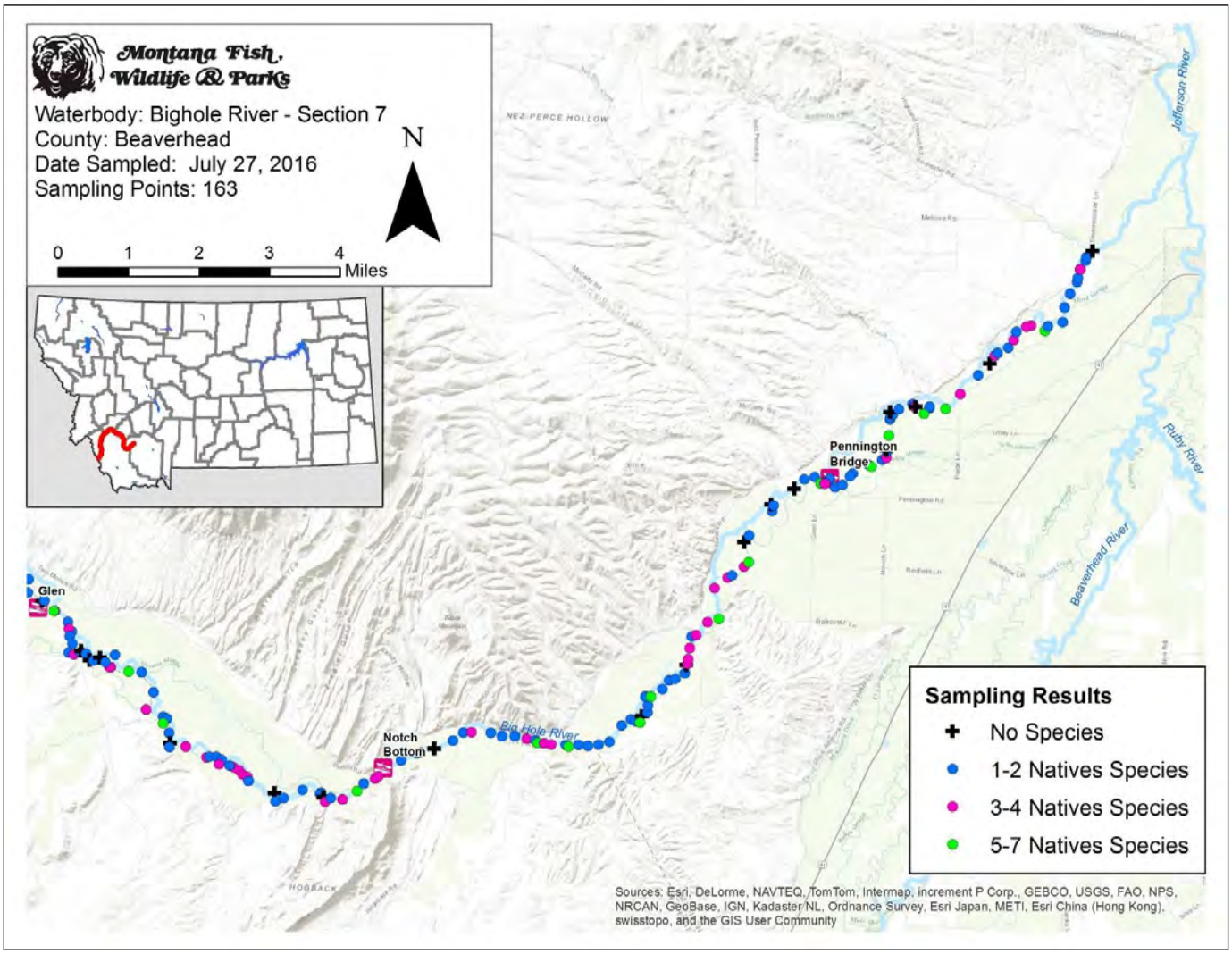

Montana Fish, Wildlife & Parks
Waterbody: Bighole River - Section 2
County: Beaverhead
Date Sampled: July 18 & 20, 2016
Sampling Points: 120
N
0 ¾ 1½ 2¼ 3 Miles
Fishtrap Creek
Sampling Results
No Species
1-2 Natives Species
3-4 Natives Species
5-7 Natives Species
8-9 Natives Species
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community


Montana Fish, Wildlife & Parks
Waterbody: Bighole River - Section 3
County: Beaverhead
Date Sampled: July 20 & 21, 2016
Sampling Points: 125
N
0 ¾ 1½ 2¼ 3 Miles
Sportsman's Park
Sampling Results
No Species
1-2 Natives Species
3-4 Natives Species
5-7 Natives Species
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community


Montana Fish, Wildlife & Parks
Waterbody: Bighole River - Section 4
County: Beaverhead
Date Sampled: July 21 & 25, 2016
Sampling Points: 70
N
0 ¾ 1½ 2¼ 3
Miles
Wise River
Roundhouse Rd
Jerry Creek
Indian Creek Rd
Big Hole River
Keystone Rd
George Grant Memorial
Greenwood Bottoms
Powerhouse
Nez Perce Gulch
Titan Gulch
Triangle Gulch
Limekiln Gulch
Quartz Hill Gulch
Sampling Results
No Species
1-2 Natives Species
3-4 Natives Species
5-7 Natives Species
8-9 Natives Species
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

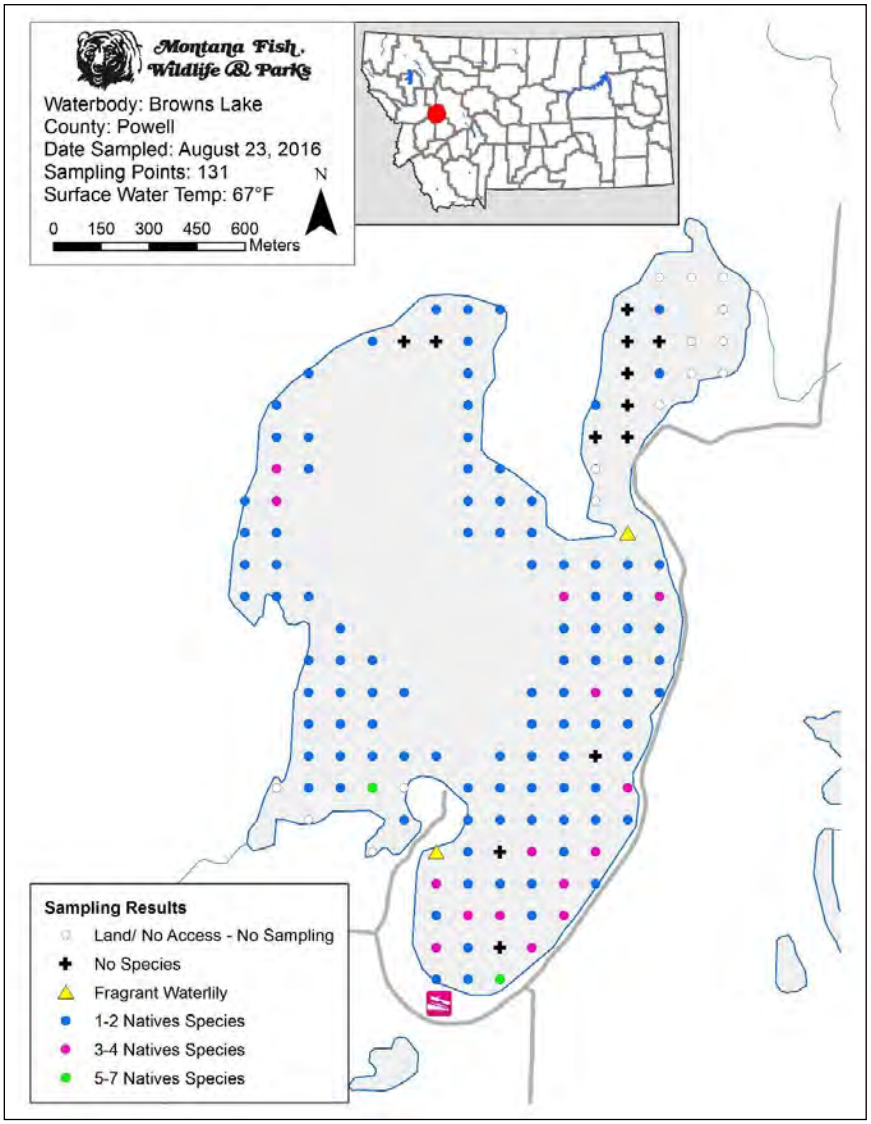

Montana Fish, Wildlife & Parks
Waterbody: Bighole River - Section 5
County: Beaverhead
Date Sampled: July 25, 2016
Sampling Points: 85
N
0 ¾ 1½ 2¼ 3 Miles
Powerhouse
Divide
Maidenrock
Big Hole River
Dry Gulch
Lamarche Gulch
Lower Canyon Creek Rd
Dry Hollow Gulch
Big Horn Rd
Old Highway 91
SILVER BOW
MADISON
Sampling Results
Land/ No Access - No Sampling
No Species
1-2 Natives Species
3-4 Natives Species
5-7 Natives Species
Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community


Montana Fish, Wildlife & Parks
Waterbody: Bighole River - Section 6
County: Beaverhead
Date Sampled: July 26, 2016
Sampling Points: 95
N
0 0.85 1.7 2.55 3.4
Miles
Salmon Fly
Browns Bridge
Kalsta Bridge
Glen
Big Hole River
Highway 91
Peck Ln
Cramer Rd
McCartney Creek
Browns Gulch Rd
Browns Bridge Rd
Kalsta Ranch Rd
Dry Timber Gulch
Mc Cartney Mountain
7931 ft
8374 ft
Devils Dancehall
Iron Canyon
Timber Canyon
Lost Creek Rd
Schoolhouse Rd
Two Moose Rd
Sampling Results
No Species
1-2 Natives Species
3-4 Natives Species
5-7 Natives Species
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community


Montana Fish, Wildlife & Parks
Waterbody: Bighole River - Section 7
County: Beaverhead
Date Sampled: July 27, 2016
Sampling Points: 163
N
0 1 2 3 4 Miles
Glen
Notch Bottom
Pennington Bridge
Big Hole River
Beaverhead River
Ruby River
Jefferson River
NEZ PERCE HOLLOW
HOGBACK
Sampling Results
No Species
1-2 Natives Species
3-4 Natives Species
5-7 Natives Species
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

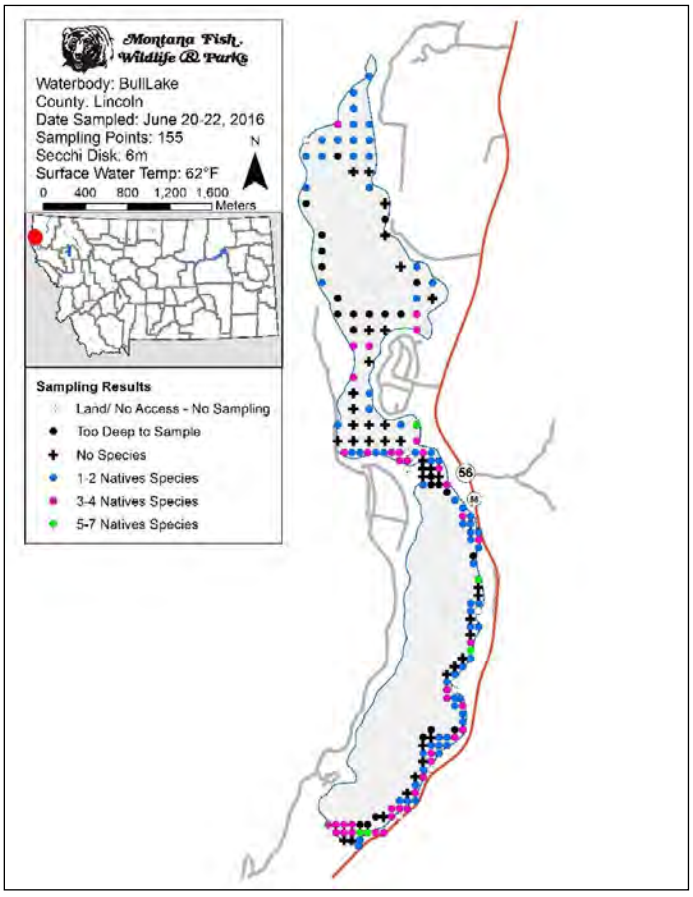
4. Browns Lake

Browns Lake	**n=131**		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	12	9.2%
Chara spp.	*Chara spp.*	106	80.9%
Leafy pondweed	*Potamogeton foliosus*	23	17.6%
Bulrush spp	*Scirpus spp.*	15	11.5%
Northern watermilfoil	*Myriophyllum sibiricum*	15	11.5%
Coontail	*Ceratophyllum demersum*	11	8.4%
Floating-leaved pondweed	*Potamogeton natans*	9	6.9%
Common bladderwort	*Utricularia vulgaris*	3	2.3%
Slender water-nymph	*Najas flexilis*	3	2.3%
White-stemmed pondweed	*Potamogeton praelongus*	3	2.3%
Fragrant waterlilly	*Nymphaea odorata*	2	1.5%
Northern arrowhead	*Sagittaria cuneata*	1	0.8%



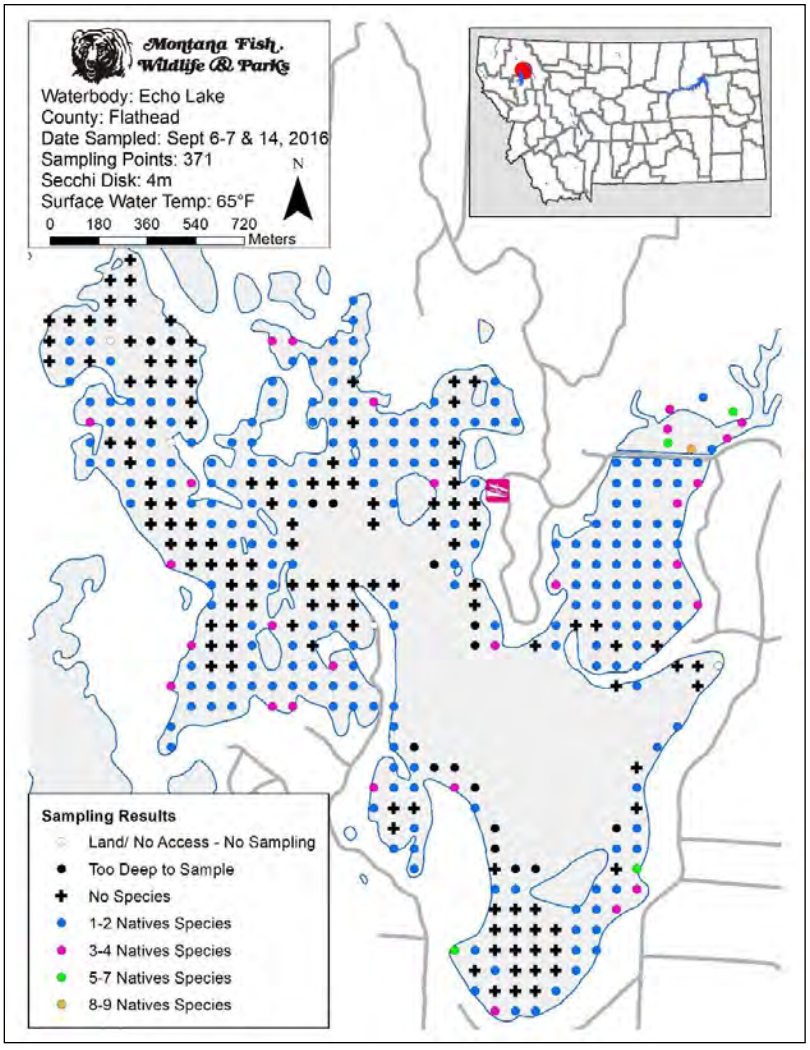
5. Bull Lake

Bull Lake	**n=155**		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	39	25.2%
Canada waterweed	*Elodea canadensis*	46	29.7%
Chara spp.	*Chara spp.*	46	29.7%
Bulrush spp	*Scirpus spp.*	31	20.0%
Fern-leaved pondweed	*Potamogeton robbinsii*	24	15.5%
White-stemmed pondweed	*Potamogeton praelongus*	23	14.8%
Northern watermilfoil	*Myriophyllum sibiricum*	17	11.0%
Potamogeton Species	*Potamogeton spp*	17	11.0%
Needle spikerush	*Eleocharis acicularis*	14	9.0%
Slender leaved pondweed	*Potamogeton filiformis*	14	9.0%
Northern arrowhead	*Sagittaria cuneata*	8	5.2%
Nitella spp.	*Nitella spp.*	6	3.9%
Quillwort species	*Isoetes spp.*	6	3.9%
Common bladderwort	*Utricularia vulgaris*	4	2.6%
White waterbuttercup	*Ranunculus aquatilis*	4	2.6%
Richardson's pondweed	*Potamogeton richardsonii*	3	1.9%
Spatterdock	*Nuphar polysepala*	3	1.9%
Common water moss	*Fontinalis antipyretica*	2	1.3%
Floating-leaved pondweed	*Potamogeton natans*	2	1.3%
Leafy pondweed	*Potamogeton foliosus*	2	1.3%
Watershield	*Brasenia schreberi*	2	1.3%
Common arrowhead	*Sagittaria latifolia*	1	0.6%



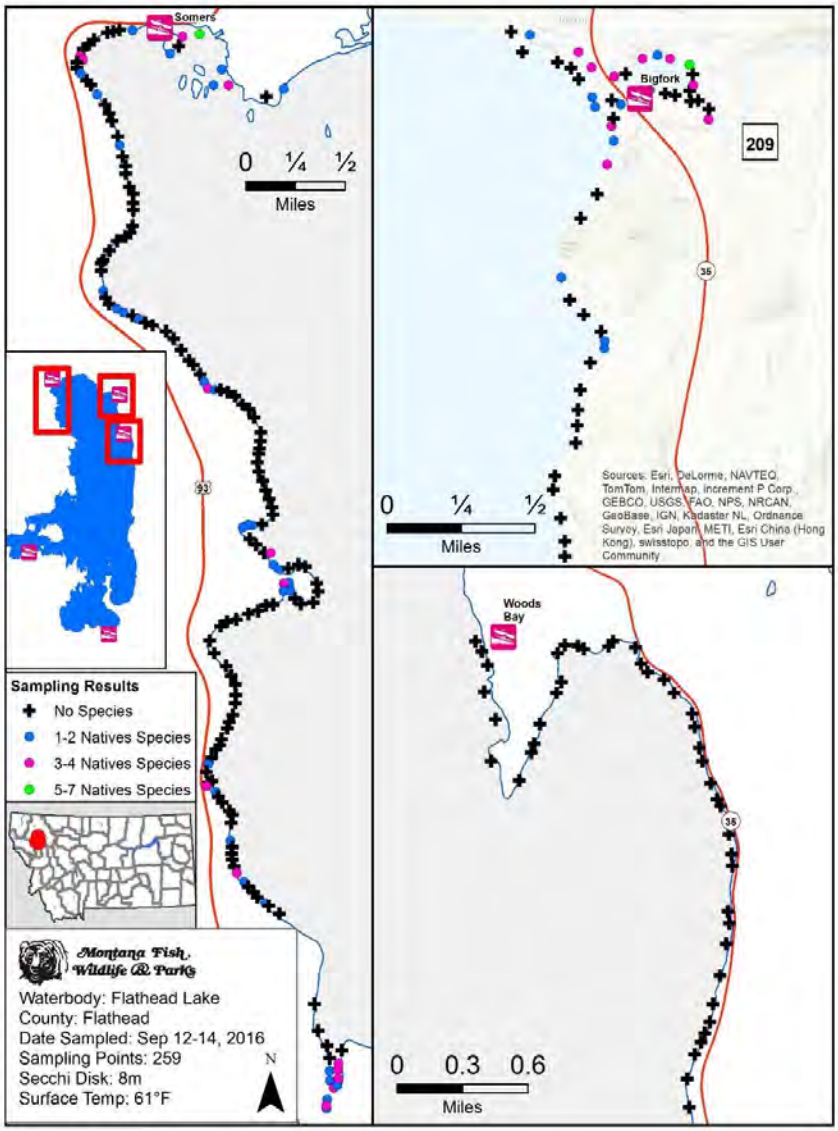
6. *Echo Lake*

Echo Lake	n=371		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	123	33.2%
Chara spp.	*Chara spp.*	218	58.8%
Slender leaved pondweed	*Potamogeton filiformis*	45	12.1%
Northern watermilfoil	*Myriophyllum sibiricum*	32	8.6%
Canada waterweed	*Elodea canadensis*	30	8.1%
Common bladderwort	*Utricularia vulgaris*	10	2.7%
Slender water-nymph	*Najas flexilis*	10	2.7%
Common water moss	*Fontinalis antipyretica*	7	1.9%
Water smartweed	*Polygonum amphibium*	7	1.9%
Leafy pondweed	*Potamogeton foliosus*	5	1.3%
White waterbuttercup	*Ranunculus aquatilis*	5	1.3%
Coontail	*Ceratophyllum demersum*	3	0.8%
Grass-leaved pondweed	*Potamogeton gramineus*	3	0.8%
Mare's tail	*Hippuris vulgaris*	3	0.8%
Flat-stem pondweed	*Potamogeton zosteriformis*	2	0.5%
Needle spikerush	*Eleocharis acicularis*	1	0.3%
White-stemmed pondweed	*Potamogeton praelongus*	1	0.3%



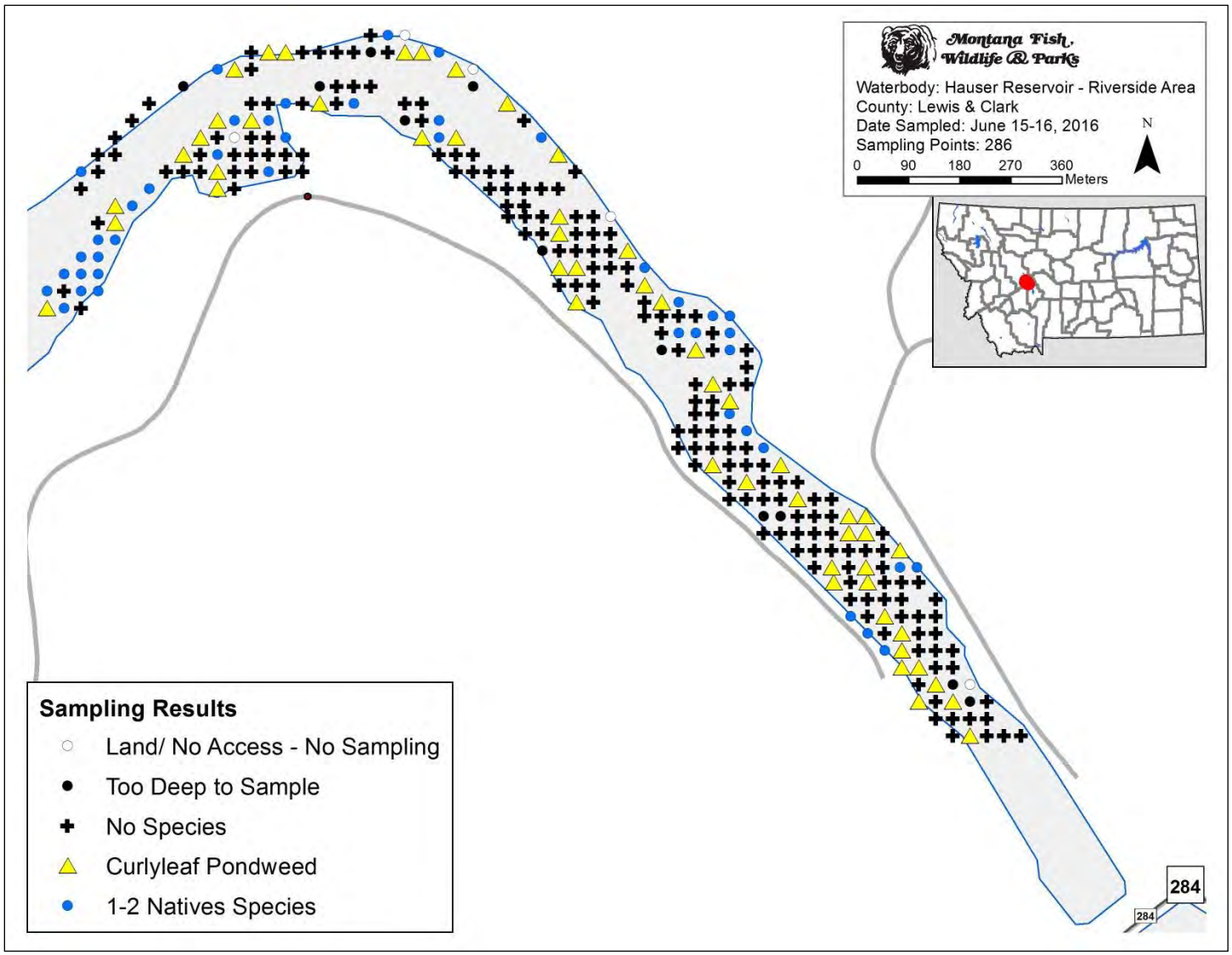
7. Flathead Lake

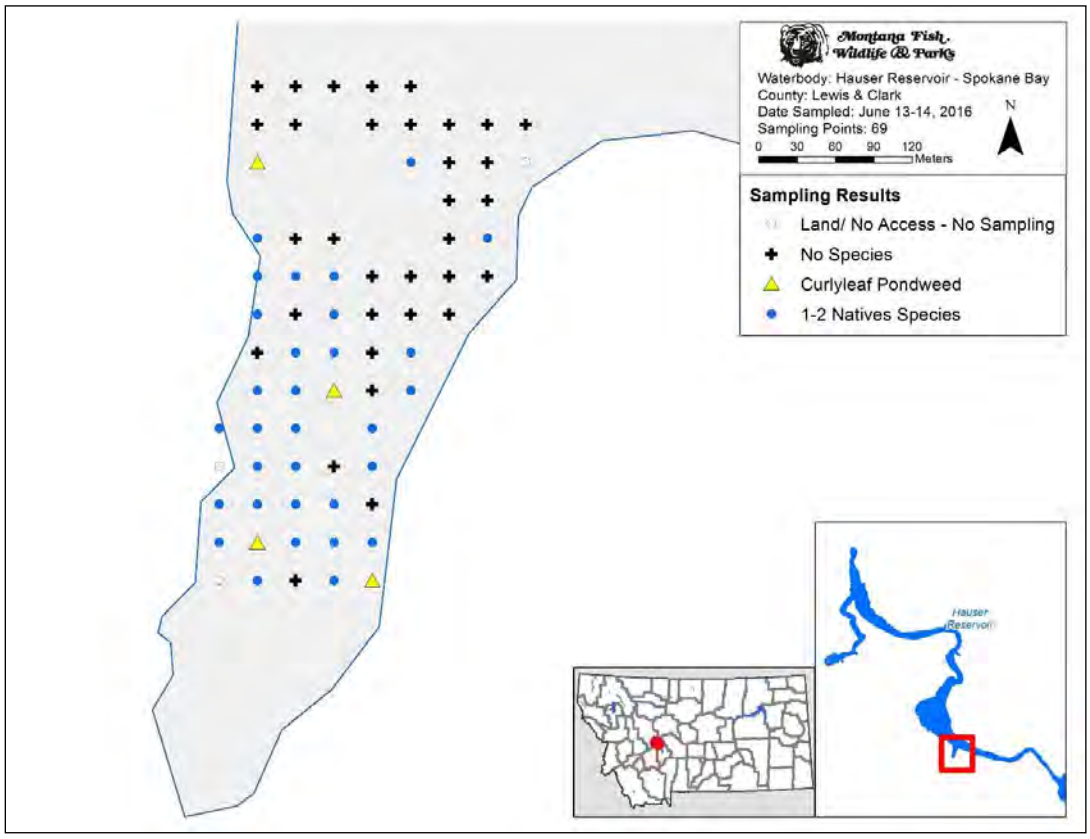
Flathead Lake	n=259		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	189	73.0%
Chara spp.	*Chara spp.*	57	22.0%
White-stemmed pondweed	*Potamogeton praelongus*	21	8.1%
Canada waterweed	*Elodea canadensis*	15	5.8%
Bulrush spp	*Scirpus spp.*	13	5.0%
Grass-leaved pondweed	*Potamogeton gramineus*	13	5.0%
Northern watermilfoil	*Myriophyllum sibiricum*	11	4.2%
Slender water-nymph	*Najas flexilis*	10	3.9%
White waterbuttercup	*Ranunculus aquatilis*	6	2.3%
Northern arrowhead	*Sagittaria cuneata*	5	1.9%
Common water moss	*Fontinalis antipyretica*	4	1.5%
Leafy pondweed	*Potamogeton foliosus*	4	1.5%
Slender leaved pondweed	*Potamogeton filiformis*	4	1.5%
Flat-stem pondweed	*Potamogeton zosteriformis*	1	0.4%

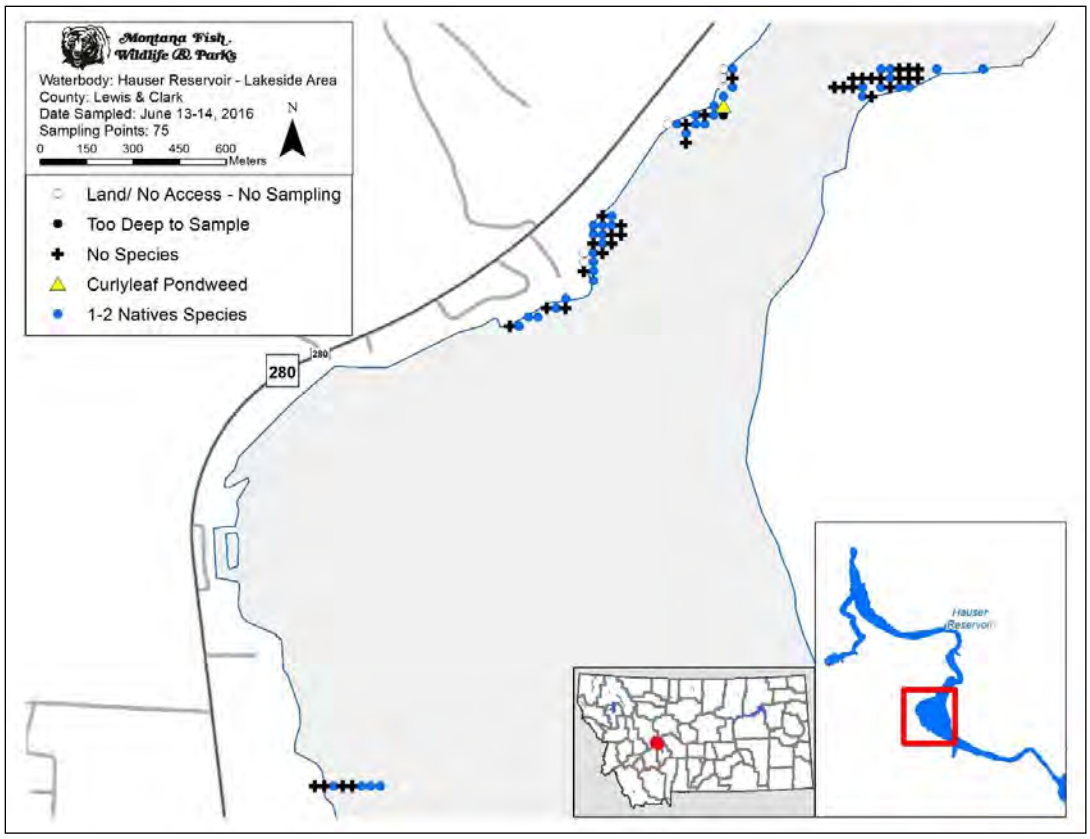


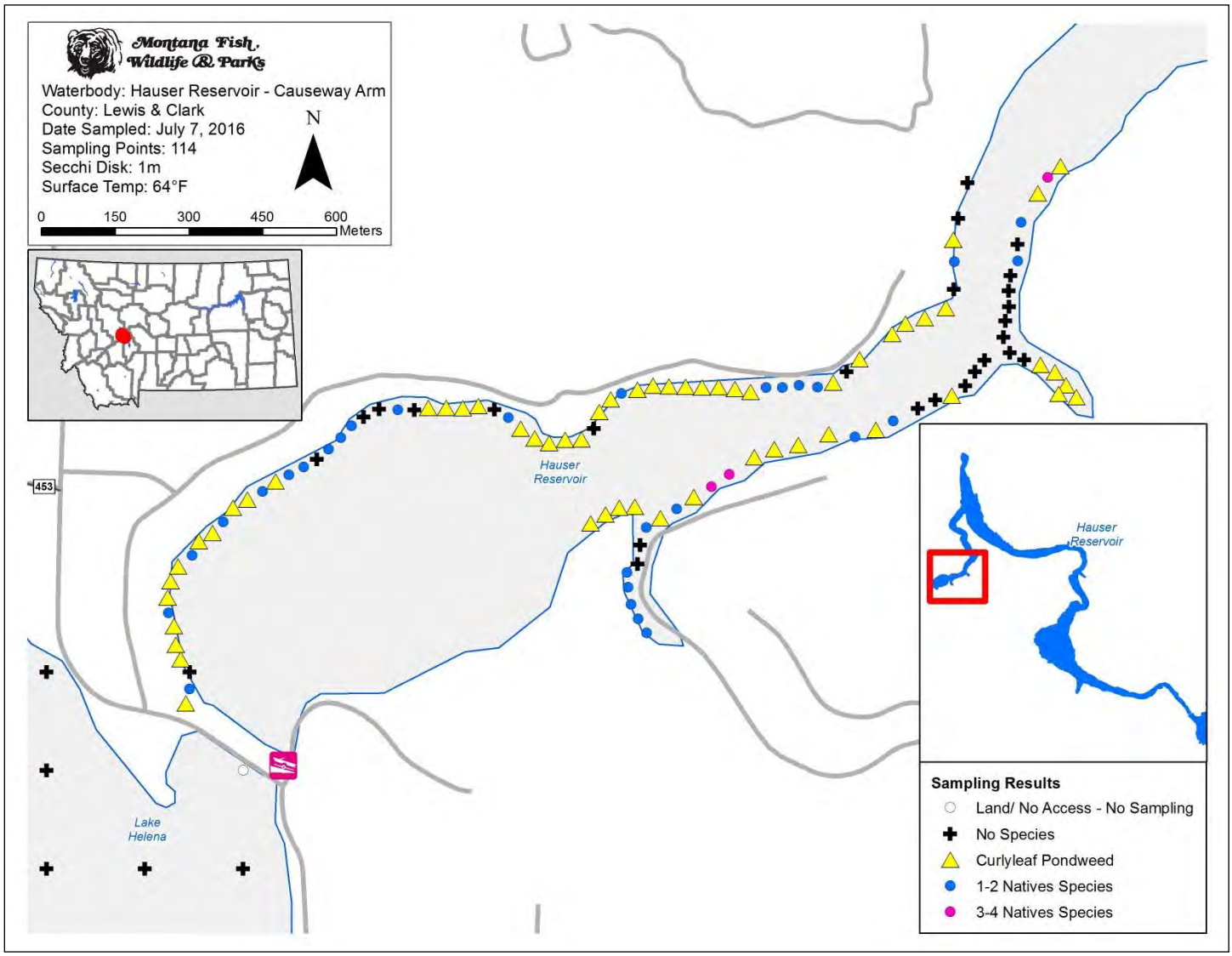
8. Hauser Lake

Hauser Reservoir	n=544		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	267	49.1%
Leafy pondweed	*Potamogeton foliosus*	122	22.4%
Curlyleaf pondweed	*Potamogeton crispus*	115	21.1%
Canada waterweed	*Elodea canadensis*	92	16.9%
Slender leaved pondweed	*Potamogeton filiformis*	28	5.1%
White waterbuttercup	*Ranunculus aquatilis*	9	1.7%
White-stemmed pondweed	*Potamogeton praelongus*	4	0.7%
Nitella spp.	*Nitella spp.*	3	0.6%
Coontail	*Ceratophyllum demersum*	1	0.2%




Montana Fish, Wildlife & Parks
Waterbody: Hauser Reservoir - Spokane Bay
County: Lewis & Clark
Date Sampled: June 13-14, 2016
Sampling Points: 69
0 30 60 90 120
Meters
N
Sampling Results
Land/ No Access - No Sampling
No Species
Curlyleaf Pondweed
1-2 Natives Species
Hauser Reservoir

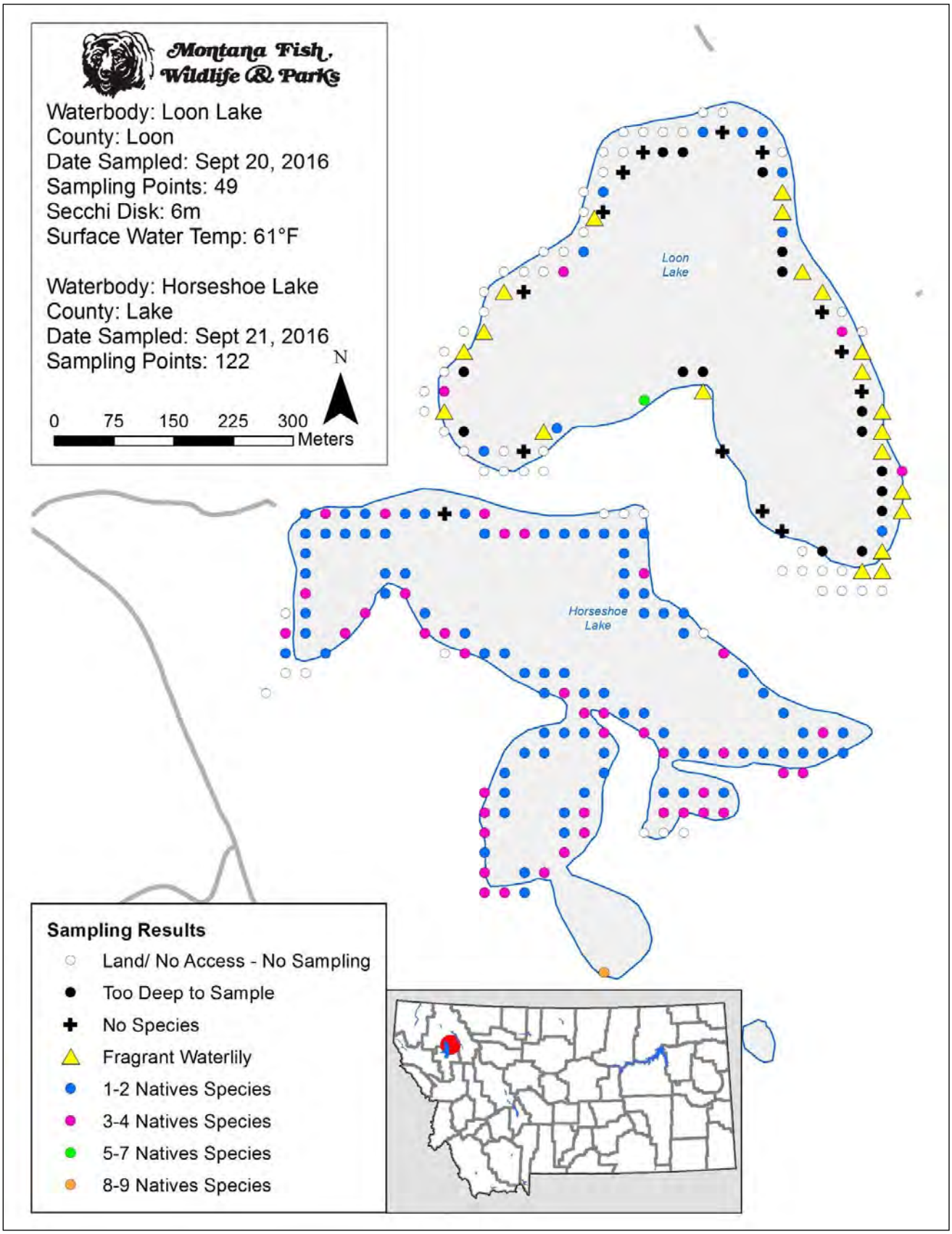

Montana Fish, Wildlife & Parks
Waterbody: Hauser Reservoir - Lakeside Area
County: Lewis & Clark
Date Sampled: June 13-14, 2016
Sampling Points: 75
0 150 300 450 600
Meters
N
Land/ No Access - No Sampling
Too Deep to Sample
No Species
Curlyleaf Pondweed
1-2 Natives Species
280
Hauser Reservoir


Montana Fish, Wildlife & Parks
Waterbody: Hauser Reservoir - Causeway Arm
County: Lewis & Clark
Date Sampled: July 7, 2016
Sampling Points: 114
Secchi Disk: 1m
Surface Temp: 64°F
N
0 150 300 450 600
Meters
453
Hauser Reservoir
Lake Helena
Hauser Reservoir
Sampling Results
Land/ No Access - No Sampling
No Species
Curlyleaf Pondweed
1-2 Natives Species
3-4 Natives Species

9. Horseshoe & Loon Lake

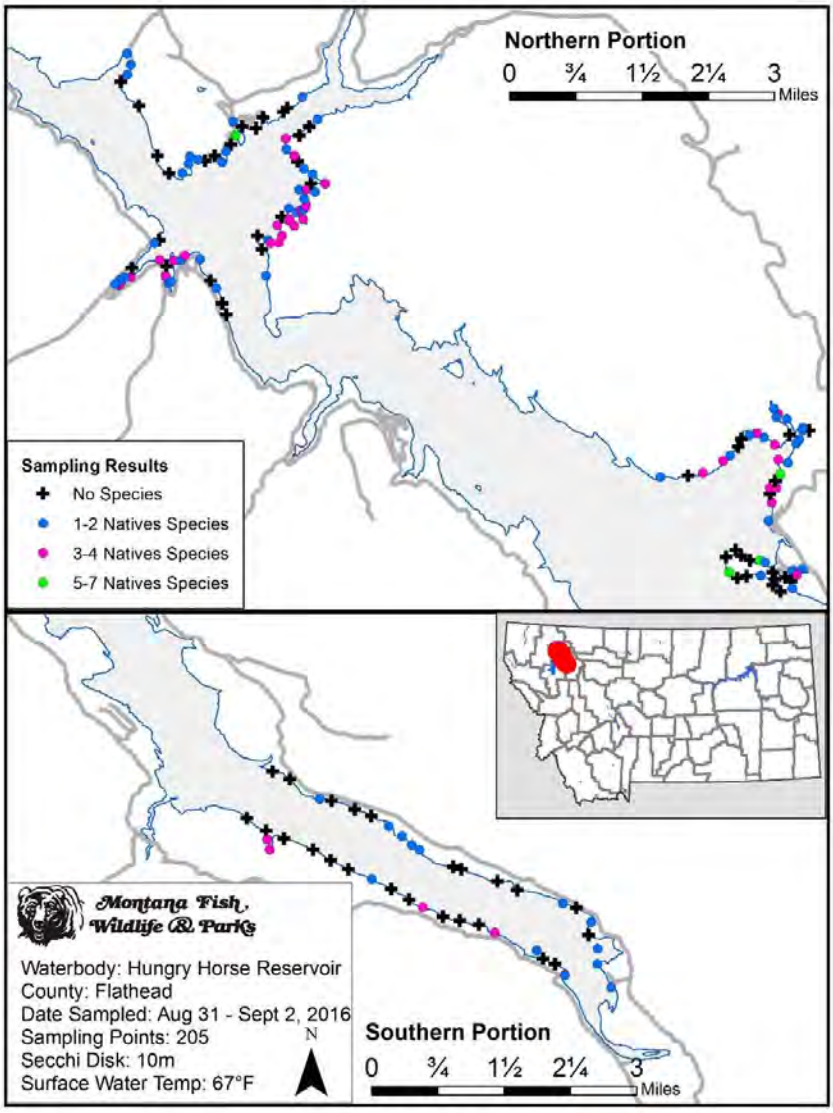
Horseshoe Lake	**n=122**		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	1	0.8%
Chara spp.	*Chara spp.*	107	87.7%
Richardson's pondweed	*Potamogeton richardsonii*	51	41.8%
Water smartweed	*Polygonum amphibium*	34	27.9%
Large-leaf pondweed	*Potamogeton amplifolius*	32	26.2%
Reed canarygrass	*Phalaris arundinacea*	28	23.0%
Grass-leaved pondweed	*Potamogeton gramineus*	11	9.0%
Leafy pondweed	*Potamogeton foliosus*	11	9.0%
Northern watermilfoil	*Myriophyllum sibiricum*	7	5.7%
Spatterdock	*Nuphar polysepala*	3	2.5%
Common bladderwort	*Utricularia vulgaris*	1	0.8%
Fern-leaved pondweed	*Potamogeton robbinsii*	1	0.8%
Slender leaved pondweed	*Potamogeton filiformis*	1	0.8%
White-stemmed pondweed	*Potamogeton praelongus*	1	0.8%

Loon Lake	**n=49**		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	12	24.5%
Chara spp.	*Chara spp.*	26	53.1%
Fragrant waterlilly	*Nymphaea odorata*	21	42.9%
Fern-leaved pondweed	*Potamogeton robbinsii*	12	24.5%
Large-leaf pondweed	*Potamogeton amplifolius*	9	18.4%
Canada waterweed	*Elodea canadensis*	8	16.3%
Grass-leaved pondweed	*Potamogeton gramineus*	8	16.3%
Slender water-nymph	*Najas flexilis*	8	16.3%
White-stemmed pondweed	*Potamogeton praelongus*	6	12.2%
Northern watermilfoil	*Myriophyllum sibiricum*	5	10.2%
Common bladderwort	*Utricularia vulgaris*	2	4.1%
Common water moss	*Fontinalis antipyretica*	2	4.1%
Coontail	*Ceratophyllum demersum*	1	2.0%
Northern arrowhead	*Sagittaria cuneata*	1	2.0%


Montana Fish, Wildlife & Parks
Waterbody: Loon Lake
County: Loon
Date Sampled: Sept 20, 2016
Sampling Points: 49
Secchi Disk: 6m
Surface Water Temp: 61°F
Waterbody: Horseshoe Lake
County: Lake
Date Sampled: Sept 21, 2016
Sampling Points: 122
N
0 75 150 225 300
Meters
Loon Lake
Horseshoe Lake
Sampling Results
Land/ No Access - No Sampling
Too Deep to Sample
No Species
Fragrant Waterlily
1-2 Natives Species
3-4 Natives Species
5-7 Natives Species
8-9 Natives Species

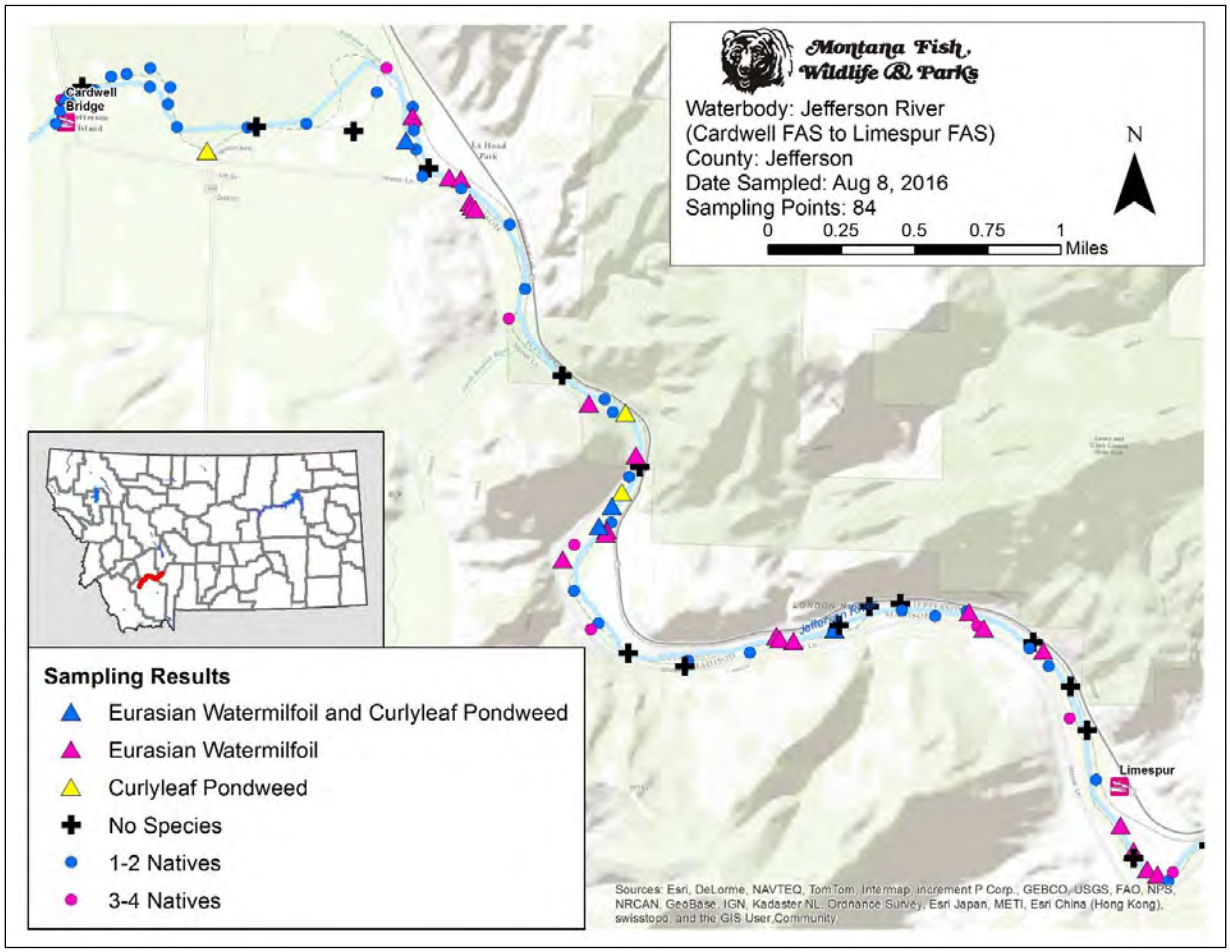
10. Hungry Horse Reservoir

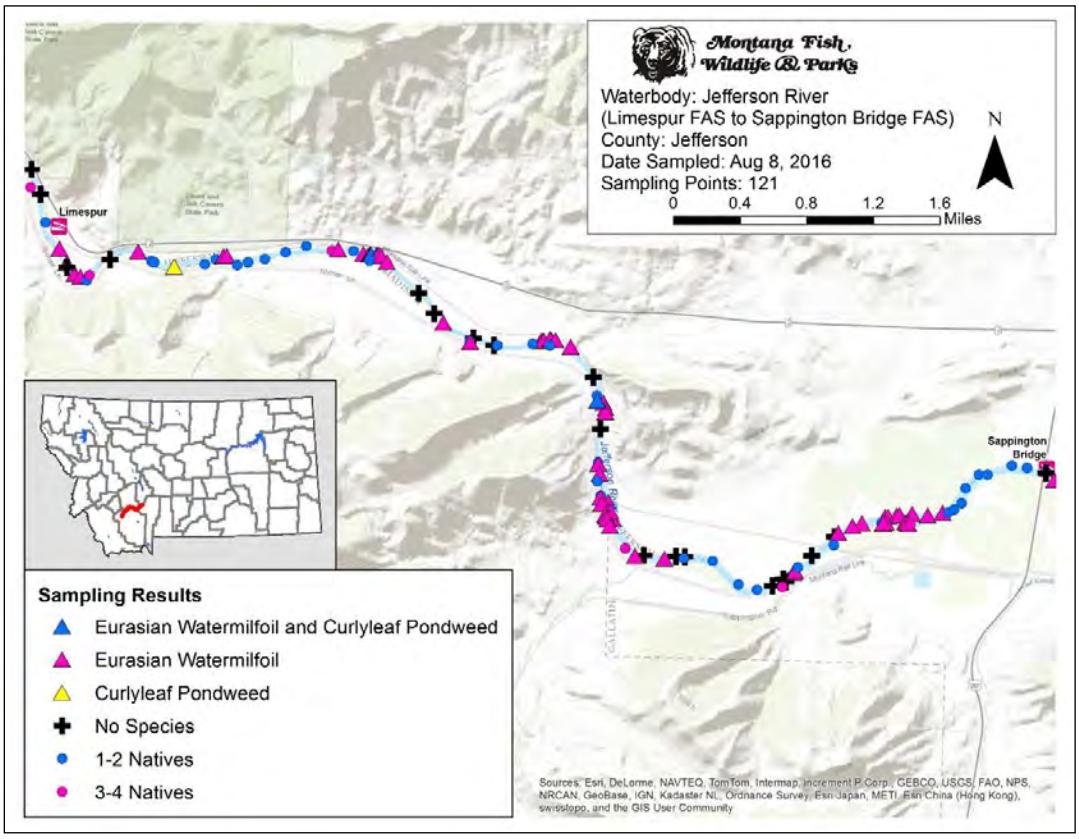
Hungry Horse Reservoir	n=205		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	12	5.9%
Reed canarygrass	*Phalaris arundinacea*	152	74.1%
Common water moss	*Fontinalis antipyretica*	75	36.6%
Unknown	*Unknown*	39	19.0%
Water mudwort	*Limosella aquatica*	30	14.6%
Chara spp.	*Chara spp.*	28	13.7%
White waterbuttercup	*Ranunculus aquatilis*	13	6.3%
Slender leaved pondweed	*Potamogeton filiformis*	6	2.9%
Puzzlegrass	*Equisetum spp.*	5	2.4%
Leafy pondweed	*Potamogeton foliosus*	4	2.0%
White-stemmed pondweed	*Potamogeton praelongus*	4	2.0%
Horned pondweed	*Zannichellia palustris*	2	1.0%
Potamogeton Species	*Potamogeton spp*	2	1.0%
Slender water-nymph	*Najas flexilis*	2	1.0%
Water smartweed	*Polygonum amphibium*	2	1.0%

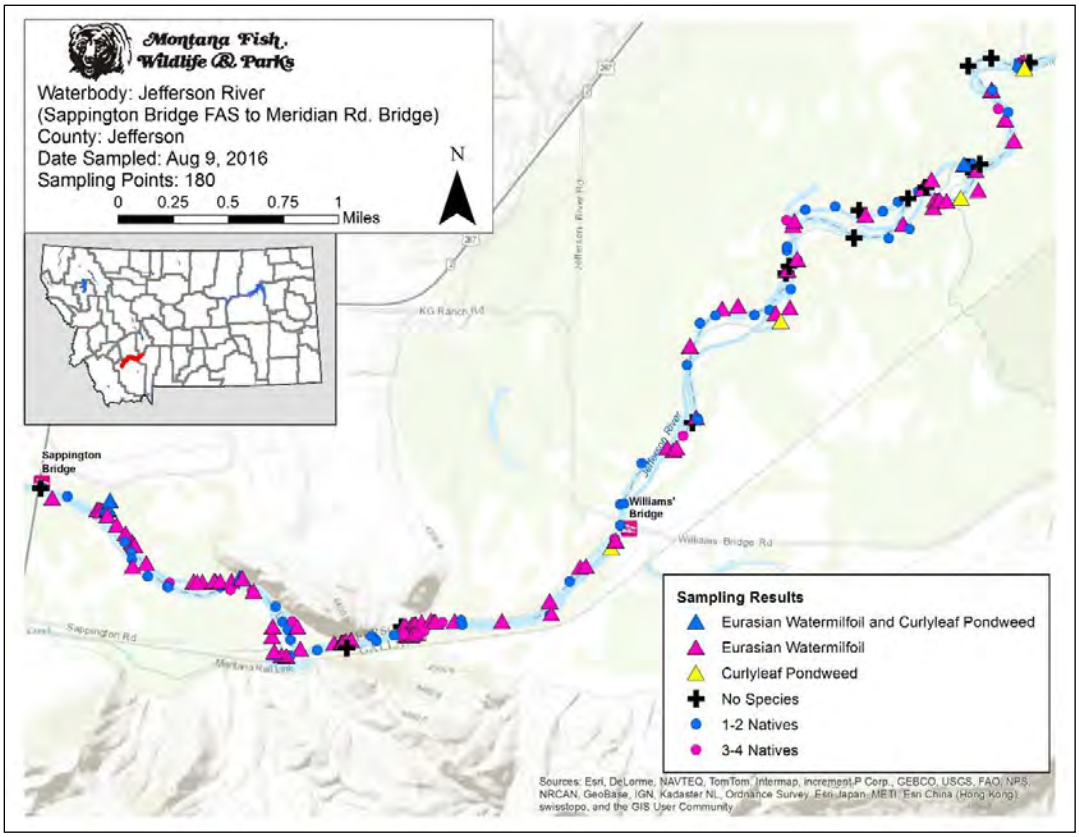


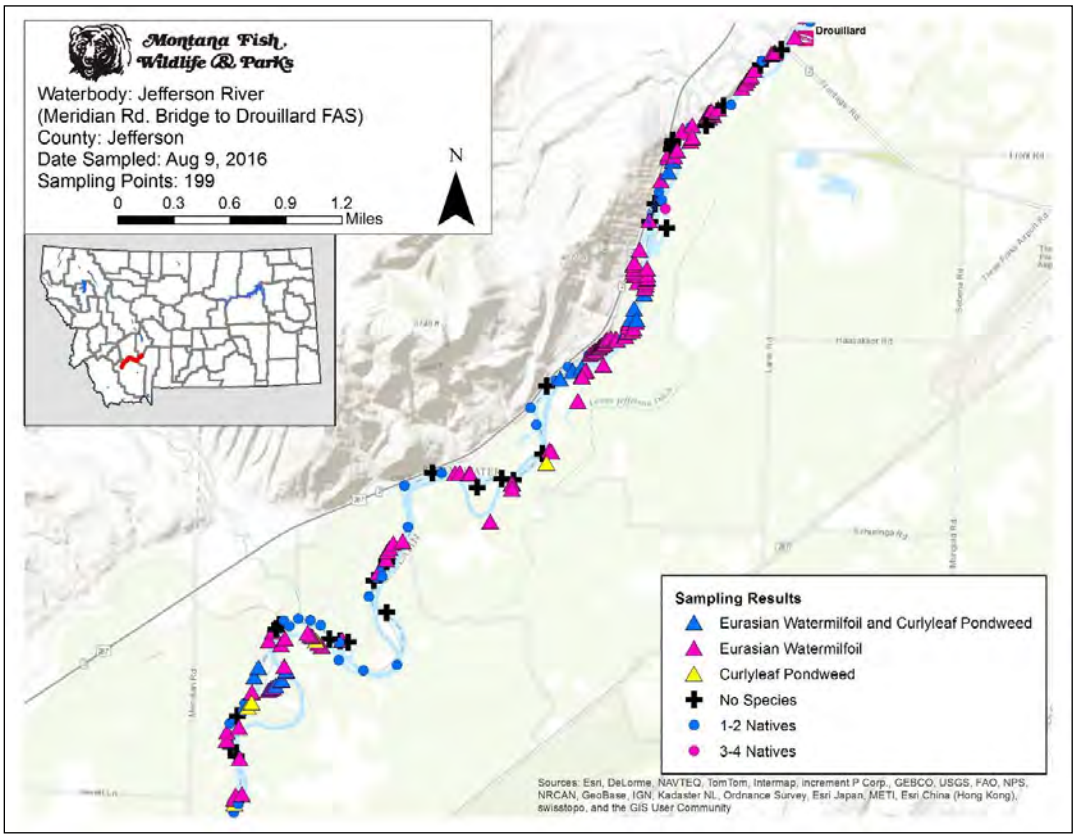
11. Jefferson River (Downstream of Cardwell)

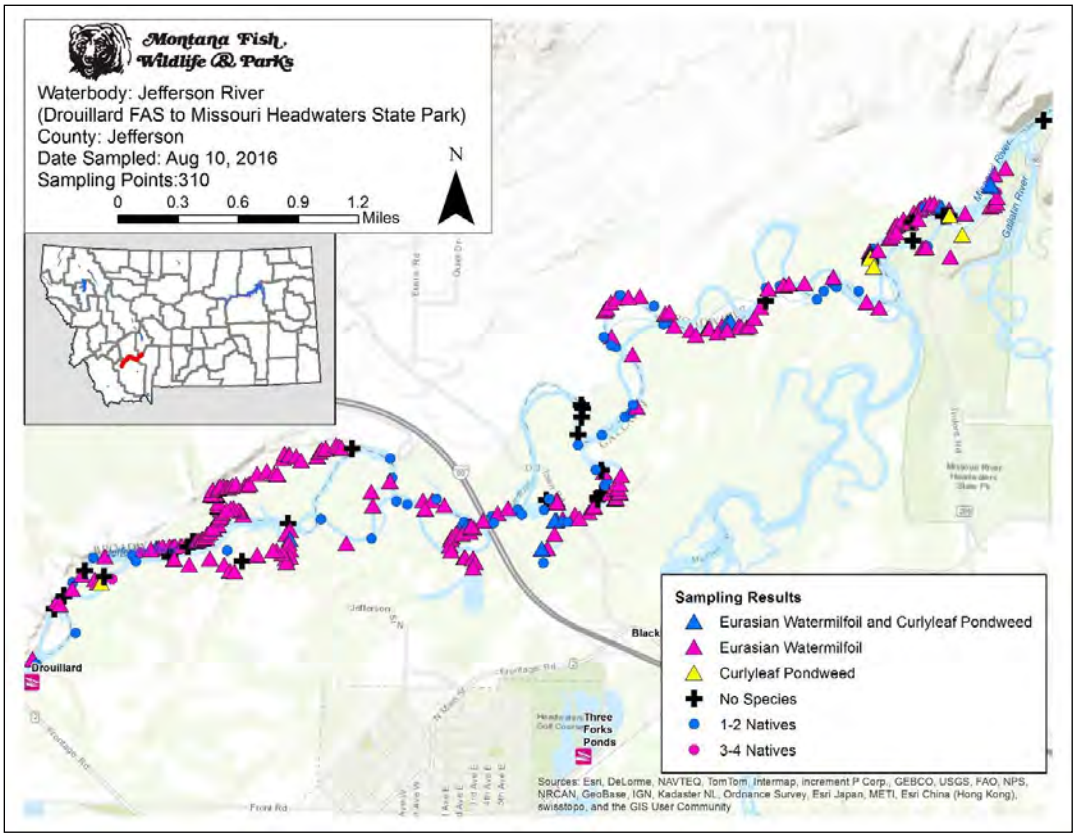
Jefferson River	n=894		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	94	10.5%
Eurasian watermilfoil	*Myriophyllum spicatum*	530	59.3%
Slender leaved pondweed	*Potamogeton filiformis*	353	39.5%
Canada waterweed	*Elodea canadensis*	267	29.9%
Curlyleaf pondweed	*Potamogeton crispus*	64	7.2%
Richardson's pondweed	*Potamogeton richardsonii*	59	6.6%
White-stemmed pondweed	*Potamogeton praelongus*	37	4.1%
Northern watermilfoil	*Myriophyllum sibiricum*	31	3.5%
White waterbuttercup	*Ranunculus aquatilis*	25	2.8%
Coontail	*Ceratophyllum demersum*	23	2.6%
Common arrowhead	*Sagittaria latifolia*	14	1.6%
Sago pondweed	*Stuckenia pectinatus*	14	1.6%
Duckweed	*Lemna spp.*	5	0.6%
Water smartweed	*Polygonum amphibium*	3	0.3%
Bulrush spp	*Scirpus spp.*	1	0.1%
Chara spp.	*Chara spp.*	1	0.1%
Mare's tail	*Hippuris vulgaris*	1	0.1%
Needle spikerush	*Eleocharis acicularis*	1	0.1%
Northern arrowhead	*Sagittaria cuneata*	1	0.1%
Potamogeton Species	*Potamogeton spp*	1	0.1%




Montana Fish, Wildlife & Parks
Waterbody: Jefferson River
(Limespur FAS to Sappington Bridge FAS)
County: Jefferson
Date Sampled: Aug 8, 2016
Sampling Points: 121
0 0.4 0.8 1.2 1.6 Miles
N
Limespur
Sappington Bridge
Sampling Results
Eurasian Watermilfoil and Curlyleaf Pondweed
Eurasian Watermilfoil
Curlyleaf Pondweed
No Species
1-2 Natives
3-4 Natives
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

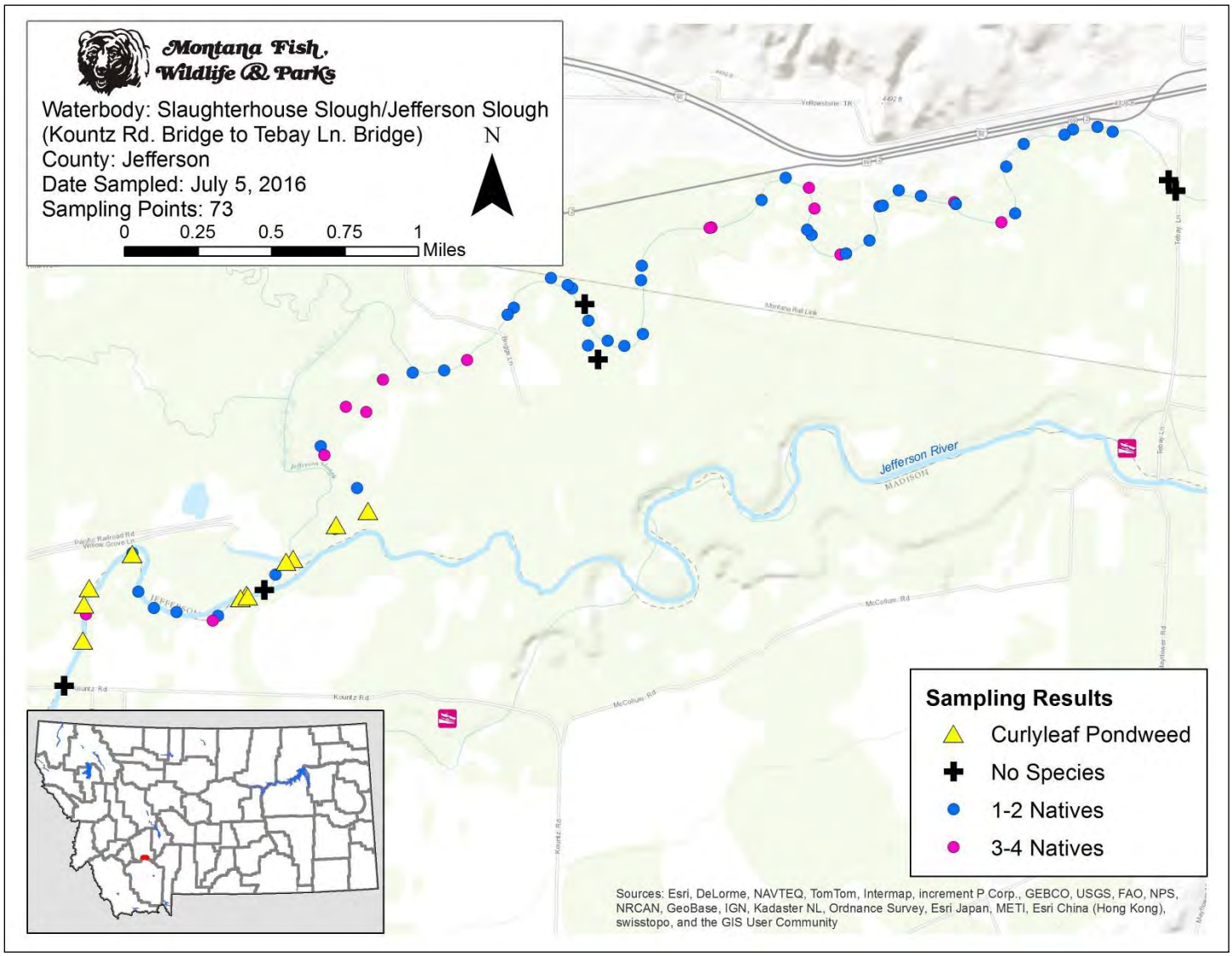

Montana Fish, Wildlife & Parks
Waterbody: Jefferson River
(Sappington Bridge FAS to Meridian Rd. Bridge)
County: Jefferson
Date Sampled: Aug 9, 2016
Sampling Points: 180
0 0.25 0.5 0.75 1 Miles
N
Sappington Bridge
Williams' Bridge
Sampling Results
Eurasian Watermilfoil and Curlyleaf Pondweed
Eurasian Watermilfoil
Curlyleaf Pondweed
No Species
1-2 Natives
3-4 Natives
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

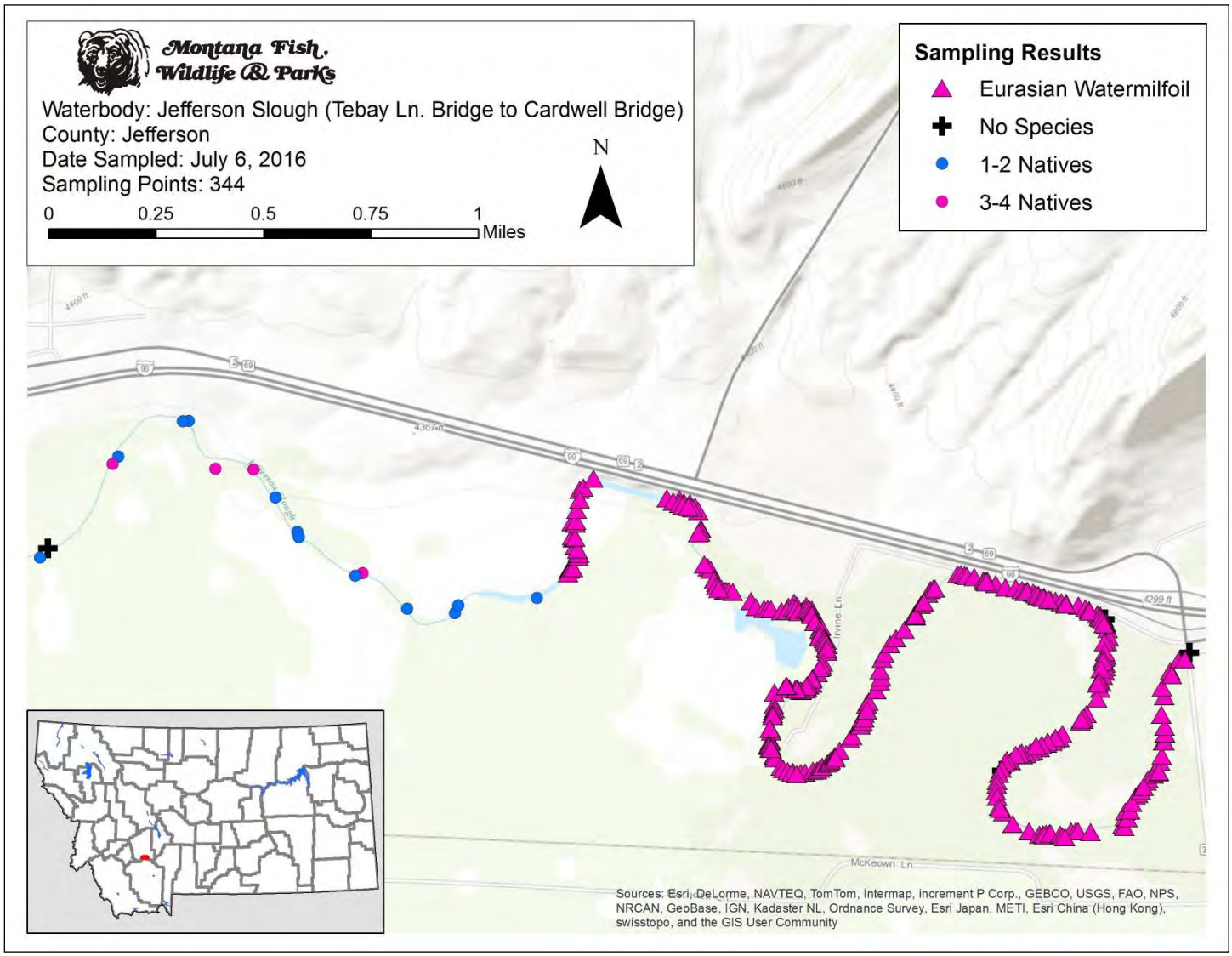

Montana Fish, Wildlife & Parks
Waterbody: Jefferson River
(Meridian Rd. Bridge to Drouillard FAS)
County: Jefferson
Date Sampled: Aug 9, 2016
Sampling Points: 199
0 0.3 0.6 0.9 1.2 Miles
N
Drouillard
Sampling Results
Eurasian Watermilfoil and Curlyleaf Pondweed
Eurasian Watermilfoil
Curlyleaf Pondweed
No Species
1-2 Natives
3-4 Natives
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community


Montana Fish, Wildlife & Parks
Waterbody: Jefferson River
(Drouillard FAS to Missouri Headwaters State Park)
County: Jefferson
Date Sampled: Aug 10, 2016
Sampling Points:310
0 0.3 0.6 0.9 1.2 Miles
N
Drouillard
Three Forks Ponds
Sampling Results
Eurasian Watermilfoil and Curlyleaf Pondweed
Eurasian Watermilfoil
Curlyleaf Pondweed
No Species
1-2 Natives
3-4 Natives
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

12. Jefferson Slough/Slaughterhouse Slough (Kountz Rd Bridge to Cardwell Bridge)

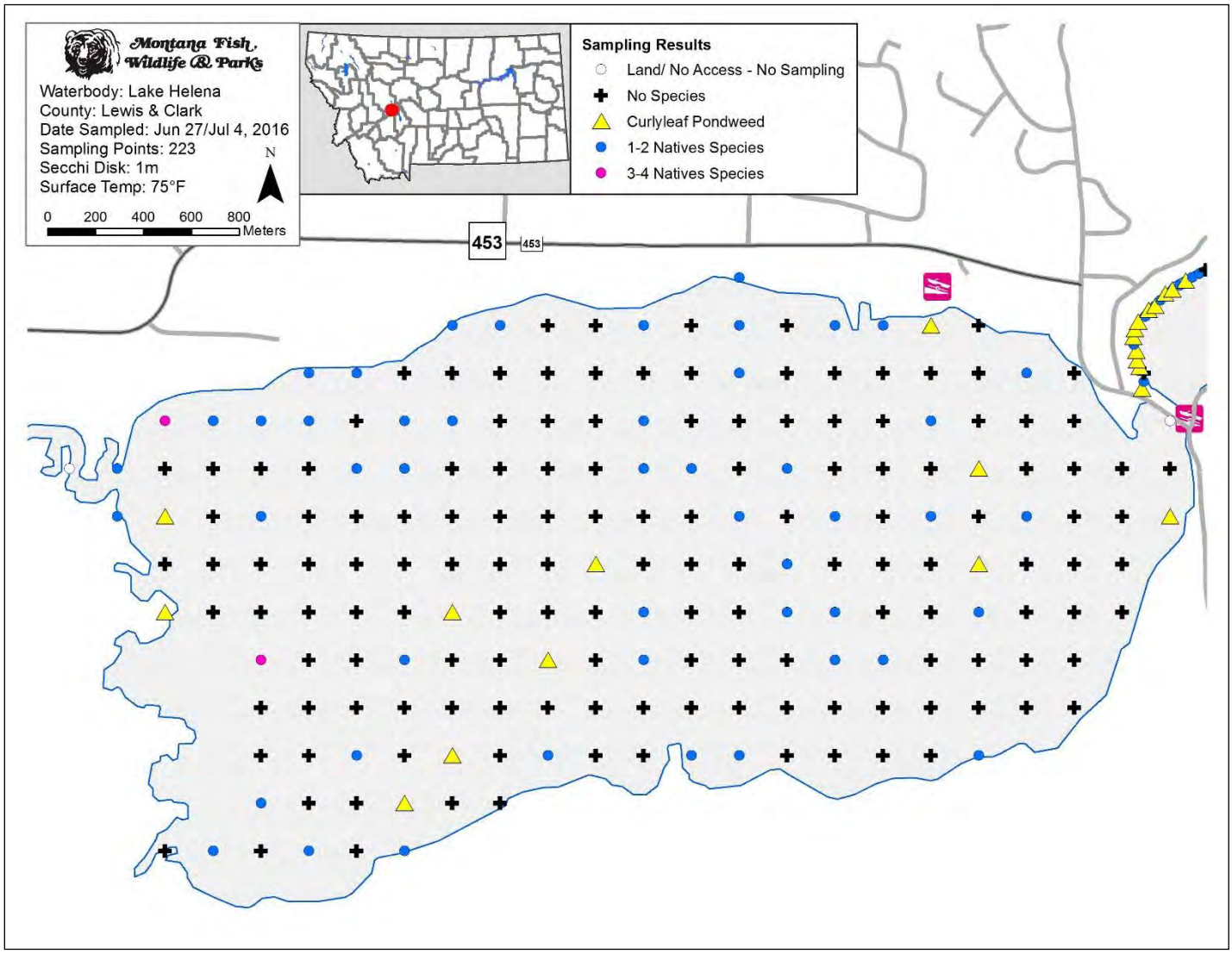
Jefferson Slough	**n=417**		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	6	1.4%
Eurasian watermilfoil	*Myriophyllum spicatum*	326	78.2%
Canada waterweed	*Elodea canadensis*	66	15.8%
Slender leaved pondweed	*Potamogeton filiformis*	52	12.5%
Northern watermilfoil	*Myriophyllum sibiricum*	30	7.2%
Coontail	*Ceratophyllum demersum*	23	5.5%
White waterbuttercup	*Ranunculus aquatilis*	22	5.3%
White-stemmed pondweed	*Potamogeton praelongus*	15	3.6%
Curlyleaf pondweed	*Potamogeton crispus*	11	2.6%
Leafy pondweed	*Potamogeton foliosus*	8	1.9%
Northern arrowhead	*Sagittaria cuneata*	5	1.2%
Bulrush spp	*Scirpus spp.*	4	1.0%




Montana Fish, Wildlife & Parks
Waterbody: Jefferson Slough (Tebay Ln. Bridge to Cardwell Bridge)
County: Jefferson
Date Sampled: July 6, 2016
Sampling Points: 344
0 0.25 0.5 0.75 1
Miles
N
Sampling Results
Eurasian Watermilfoil
No Species
1-2 Natives
3-4 Natives
Irvine Ln
McKeown Ln
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

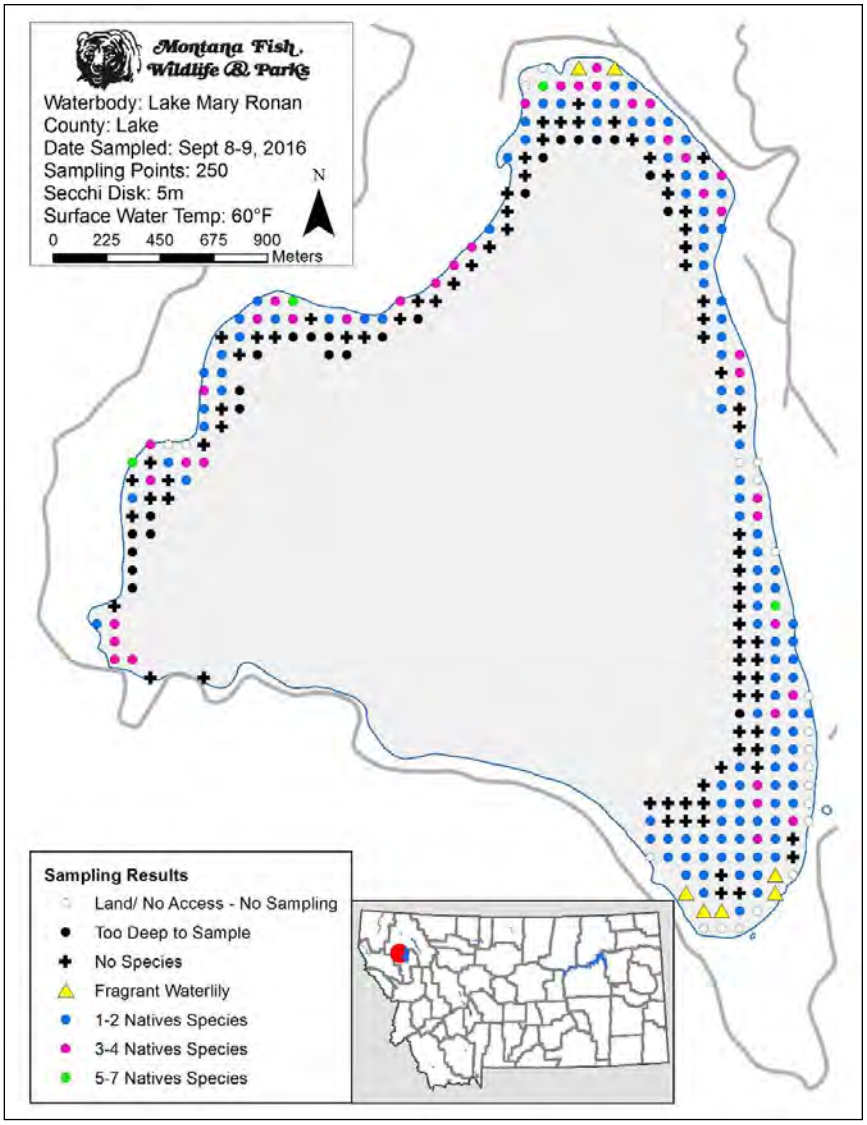
13. Lake Helena

Lake Helena	n=223		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	141	63.2%
Slender leaved pondweed	*Potamogeton filiformis*	40	17.9%
Curlyleaf pondweed	*Potamogeton crispus*	11	4.9%
Leafy pondweed	*Potamogeton foliosus*	11	4.9%
Canada waterweed	*Elodea canadensis*	8	3.6%
Horned pondweed	*Zannichellia palustris*	5	2.2%
Nitella spp.	*Nitella spp.*	5	2.2%
Common water moss	*Fontinalis antipyretica*	1	0.4%
White waterbuttercup	*Ranunculus aquatilis*	1	0.4%



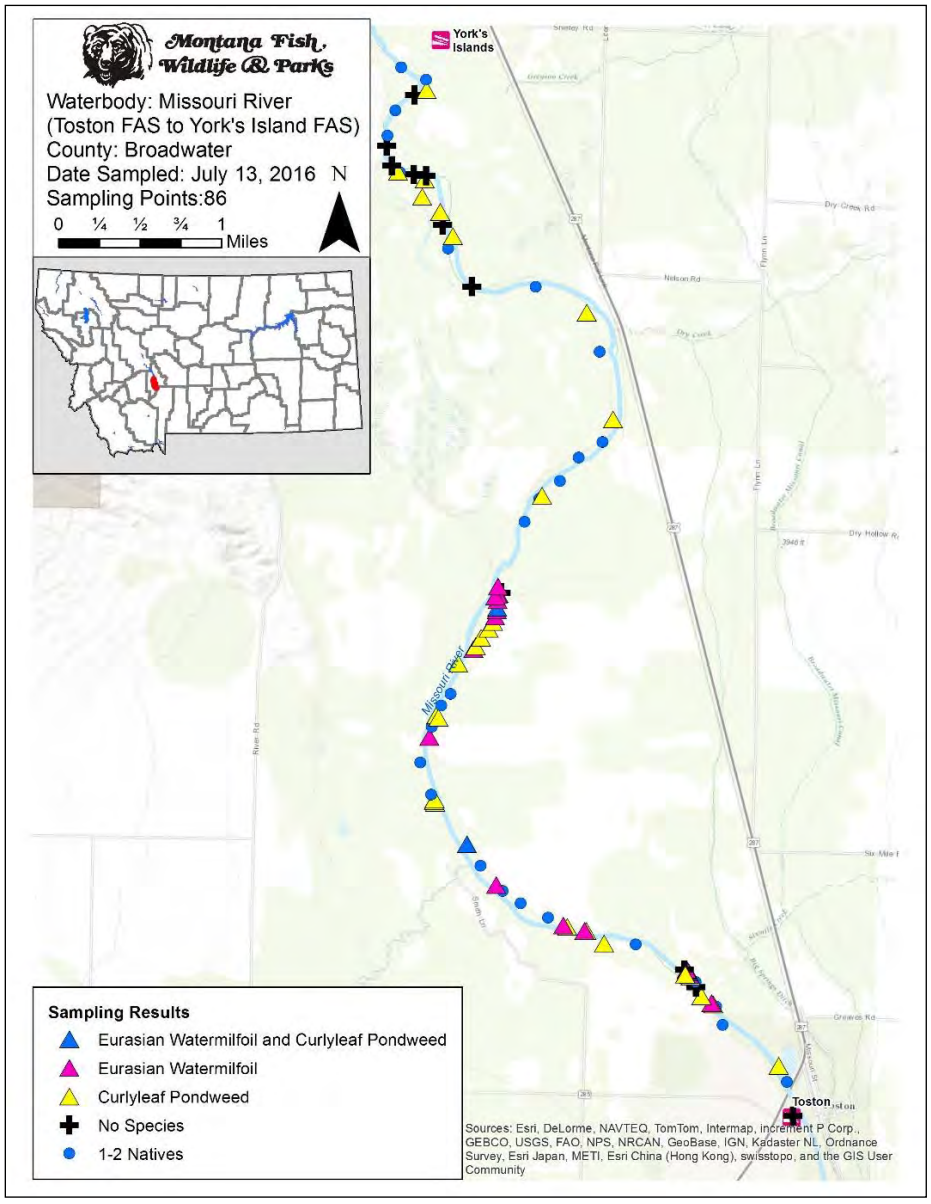
14. Lake Mary Ronan

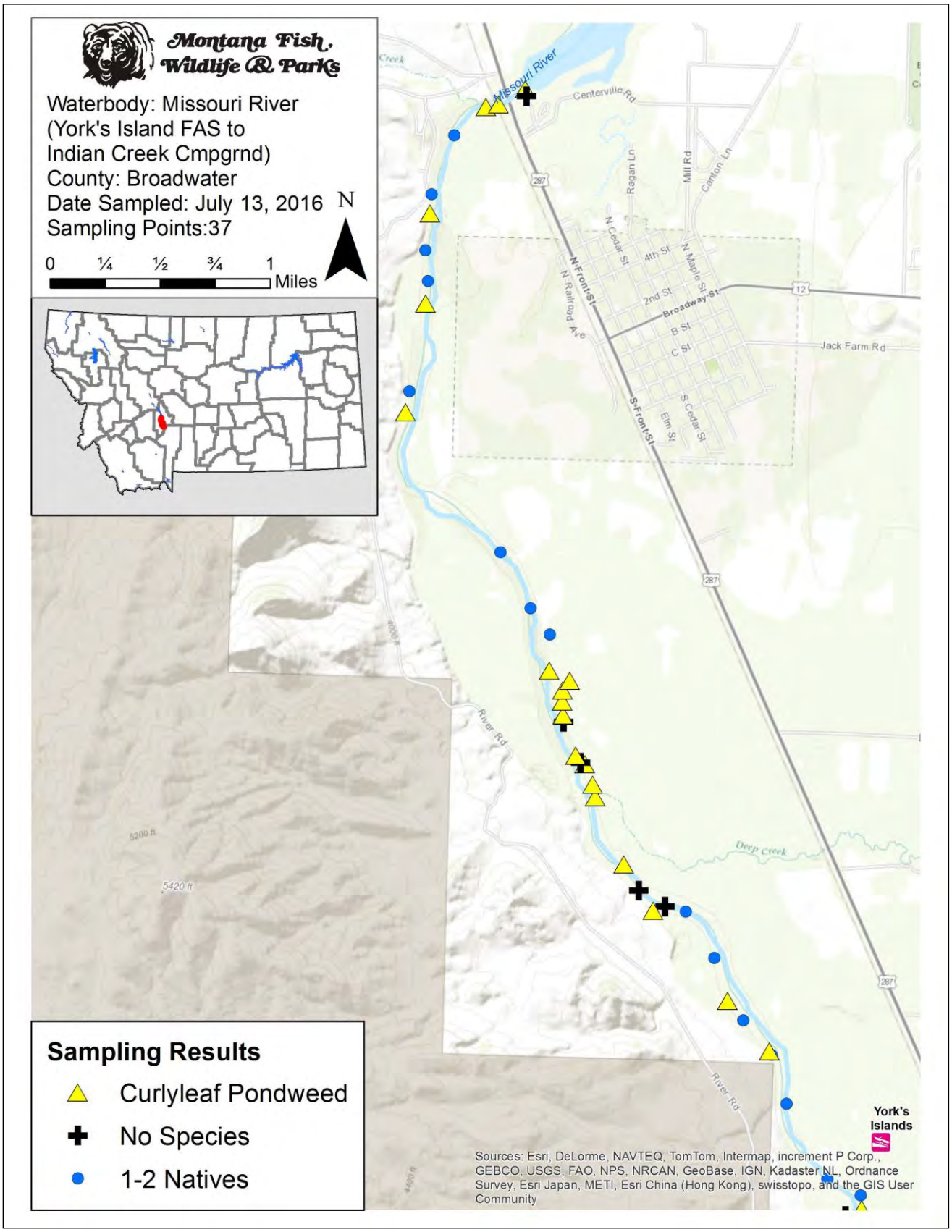
Lake Mary Ronan	n=250		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	83	33.2%
Canada waterweed	*Elodea canadensis*	116	46.4%
White-stemmed pondweed	*Potamogeton praelongus*	94	37.6%
Northern watermilfoil	*Myriophyllum sibiricum*	33	13.2%
Chara spp.	*Chara spp.*	27	10.8%
Fern-leaved pondweed	*Potamogeton robbinsii*	24	9.6%
Coontail	*Ceratophyllum demersum*	23	9.2%
Bulrush spp	*Scirpus spp.*	9	3.6%
Fragrant waterlilly	*Nymphaea odorata*	7	2.8%
Slender leaved pondweed	*Potamogeton filiformis*	4	1.6%
Needle spikerush	*Eleocharis acicularis*	2	0.8%
Common water moss	*Fontinalis antipyretica*	1	0.4%
Floating-leaved pondweed	*Potamogeton natans*	1	0.4%
Nitella spp.	*Nitella spp.*	1	0.4%

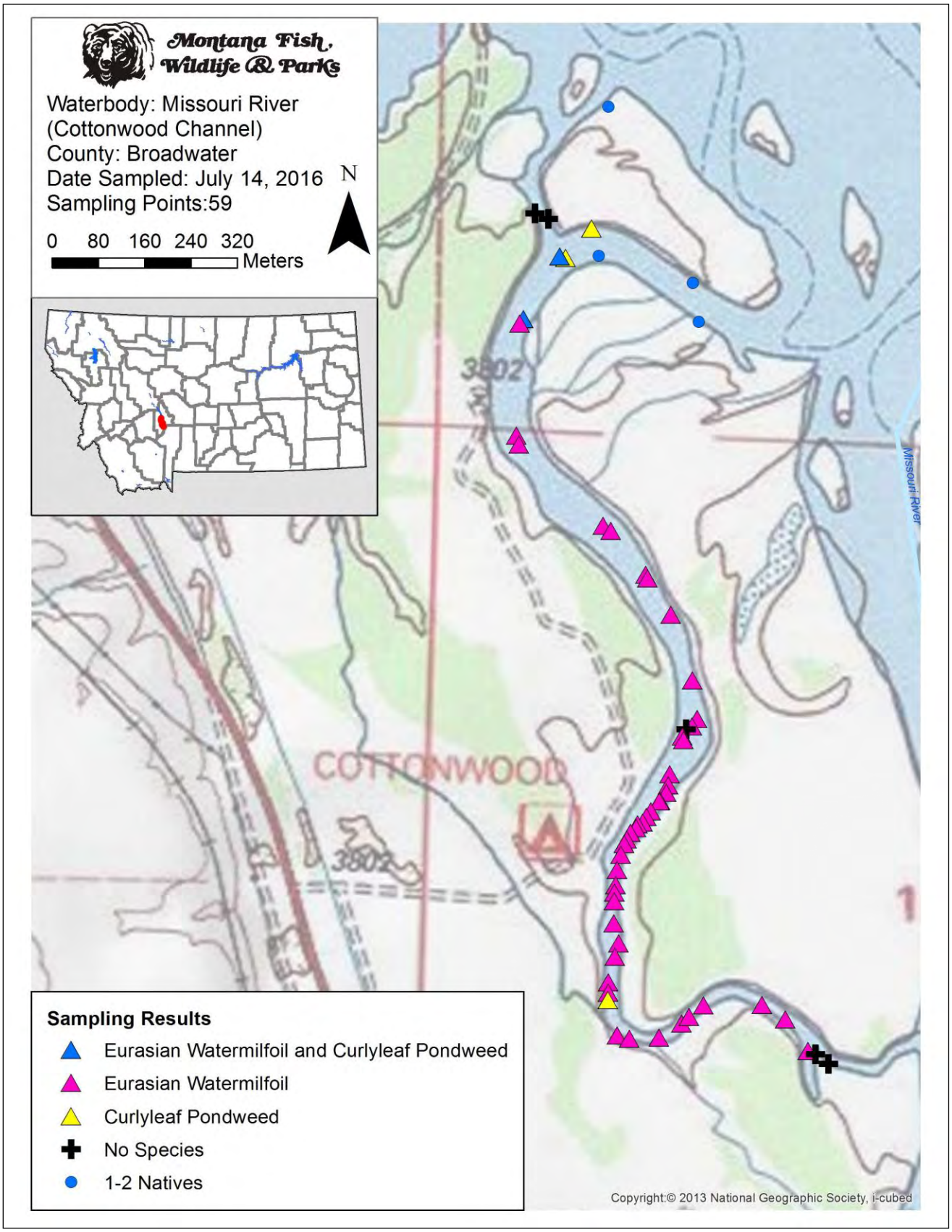


15. Missouri River (Toston to Canyon Ferry Reservoir)

Missouri River	**n=182**		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	22	12.1%
Eurasian watermilfoil	*Myriophyllum spicatum*	69	37.9%
Curlyleaf pondweed	*Potamogeton crispus*	55	30.2%
Slender leaved pondweed	*Potamogeton filiformis*	55	30.2%
Northern watermilfoil	*Myriophyllum sibiricum*	6	3.3%
Bulrush spp	*Scirpus spp.*	3	1.6%
White waterbuttercup	*Ranunculus aquatilis*	3	1.6%
Canada waterweed	*Elodea canadensis*	2	1.1%
Coontail	*Ceratophyllum demersum*	2	1.1%
Water smartweed	*Polygonum amphibium*	2	1.1%
Leafy pondweed	*Potamogeton foliosus*	1	0.5%
White-stemmed pondweed	*Potamogeton praelongus*	1	0.5%




Montana Fish, Wildlife & Parks
Waterbody: Missouri River
(York's Island FAS to
Indian Creek Cmpgrnd)
County: Broadwater
Date Sampled: July 13, 2016
Sampling Points:37
N
0 ¼ ½ ¾ 1
Miles
Missouri River
Centerville Rd
Ragan Ln
Mill Rd
Canton Ln
N Cedar St
4th St
N Maple St
N Front St
N Railroad Ave
2nd St
Broadway St
12
B St
C St
Jack Farm Rd
S Front St
Elm St
S Cedar St
287
River Rd
Deep Creek
5200 ft
5420 ft
Sampling Results
Curlyleaf Pondweed
No Species
1-2 Natives
York's Islands
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community


Montana Fish, Wildlife & Parks
Waterbody: Missouri River
(Cottonwood Channel)
County: Broadwater
Date Sampled: July 14, 2016
Sampling Points:59
N
0 80 160 240 320
Meters
3802
COTTONWOOD
3802
Missouri River
Sampling Results
Eurasian Watermilfoil and Curlyleaf Pondweed
Eurasian Watermilfoil
Curlyleaf Pondweed
No Species
1-2 Natives
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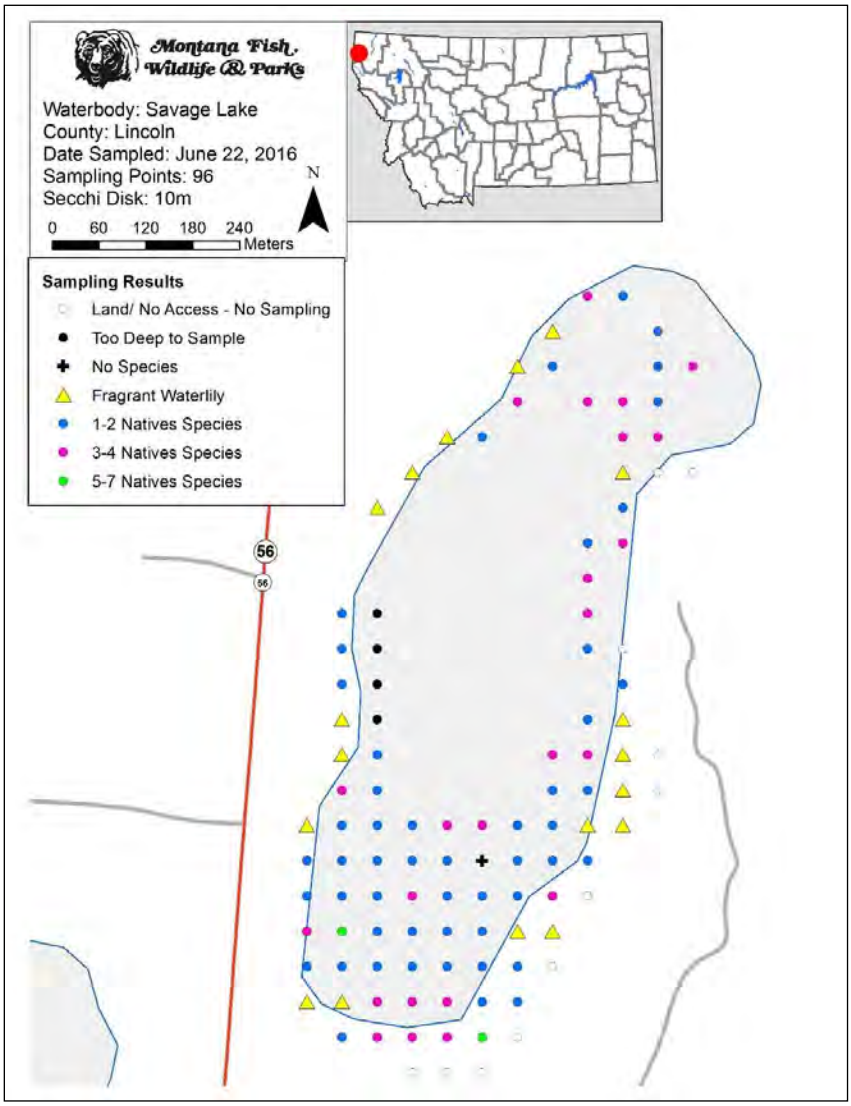
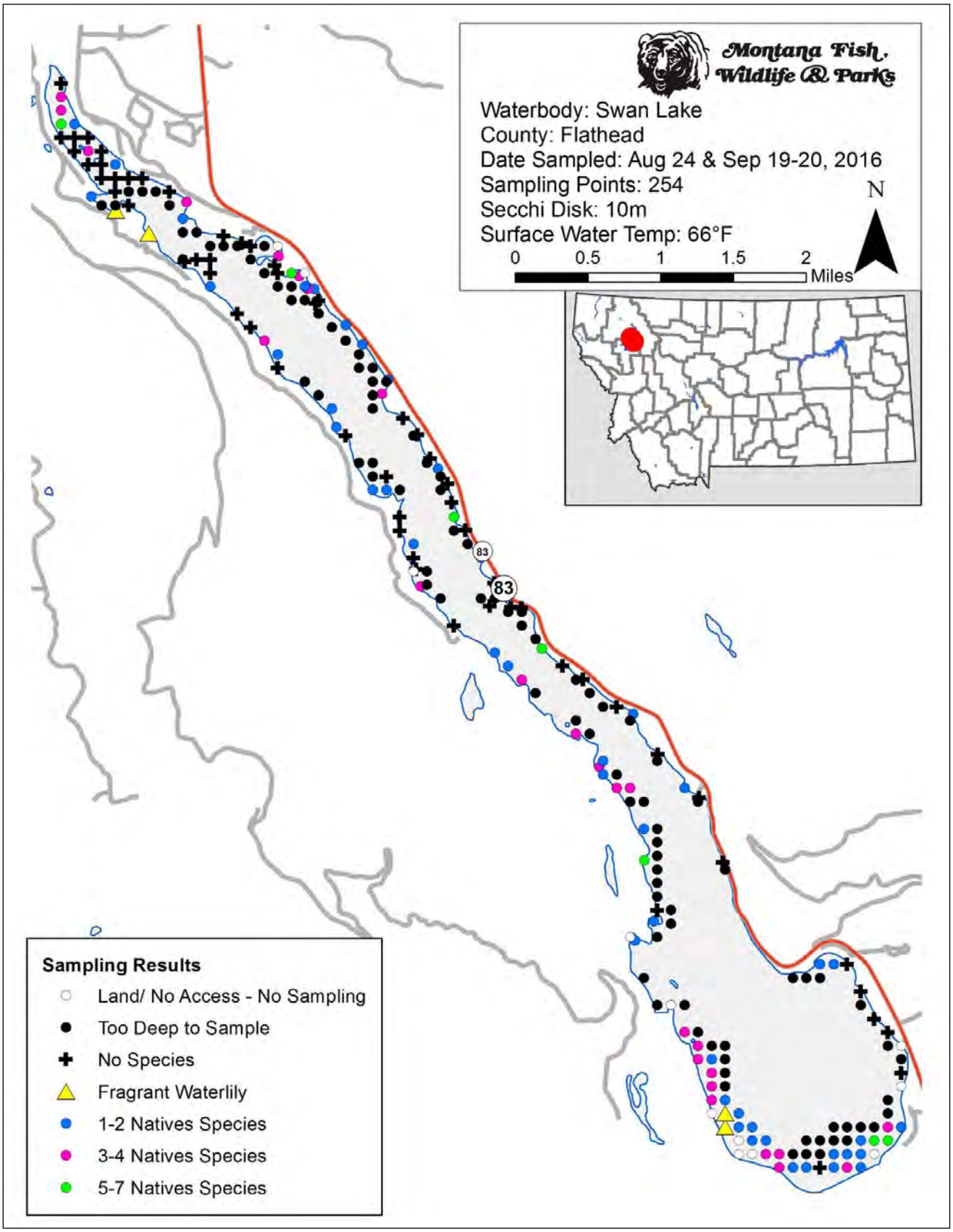
16. Savage Lake

Savage Lake	**n=96**		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	1	1.0%
Chara spp.	*Chara spp.*	76	79.2%
Slender water-nymph	*Najas flexilis*	36	37.5%
White-stemmed pondweed	*Potamogeton praelongus*	35	36.5%
Northern watermilfoil	*Myriophyllum sibiricum*	24	25.0%
Potamogeton Species	*Potamogeton spp*	18	18.8%
Fragrant waterlilly	*Nymphaea odorata*	17	17.7%
Common water moss	*Fontinalis antipyretica*	5	5.2%
Flat-stem pondweed	*Potamogeton zosteriformis*	5	5.2%
Spatterdock	*Nuphar polysepala*	5	5.2%
Large-leaf pondweed	*Potamogeton amplifolius*	4	4.2%
Sago pondweed	*Stuckenia pectinatus*	4	4.2%
Floating-leaved pondweed	*Potamogeton natans*	2	2.1%
Slender leaved pondweed	*Potamogeton filiformis*	2	2.1%
Yellow flag iris	*Iris pseudacorus*	1	1.0%



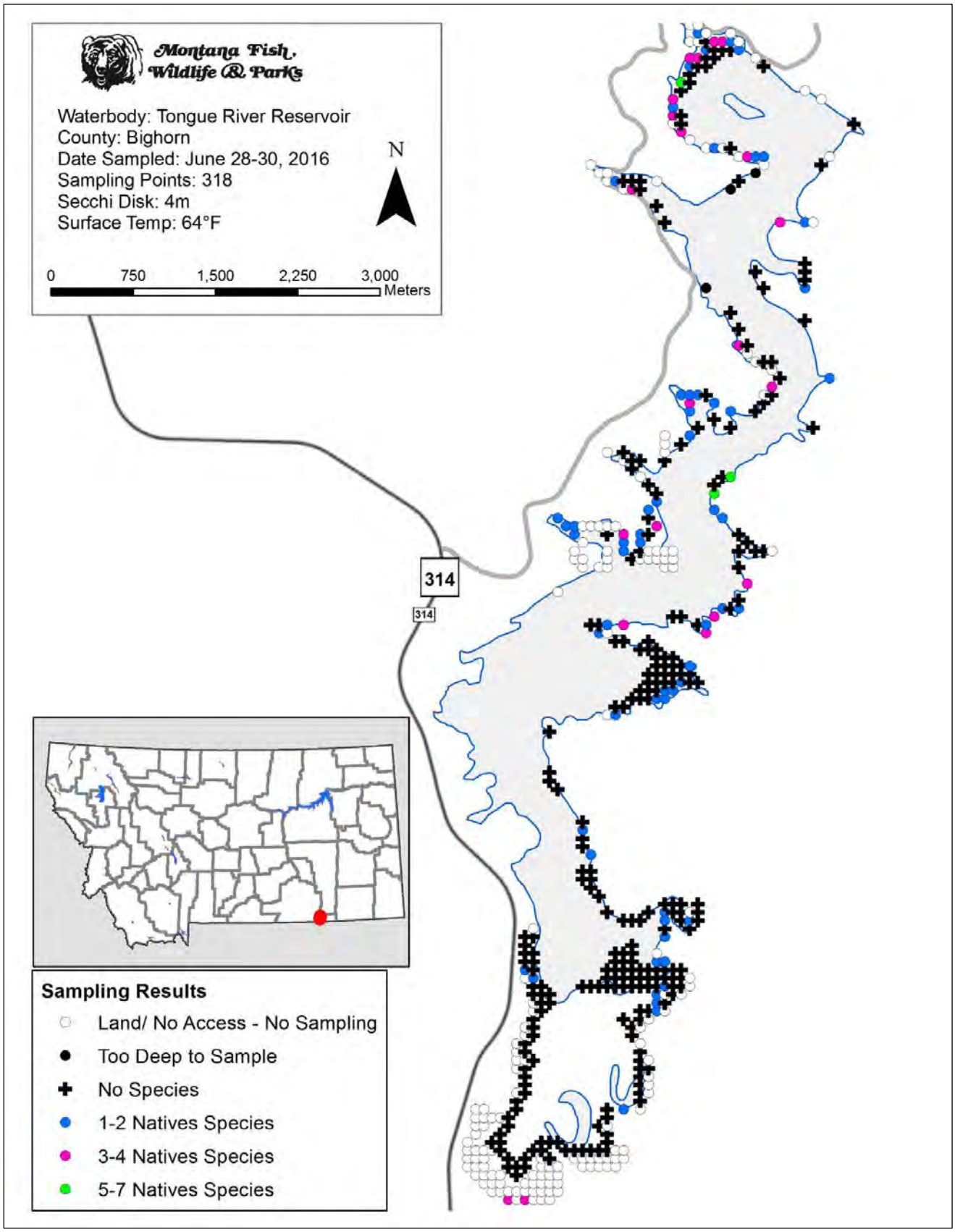
17. Swan Lake

Swan Lake	**n=254**		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	59	23.2%
Beck's Water-marigold	*Bidens beckii*	14	5.5%
Bulrush spp	*Scirpus spp.*	9	3.5%
Canada waterweed	*Elodea canadensis*	8	3.1%
Chara spp.	*Chara spp.*	58	22.8%
Common bladderwort	*Utricularia vulgaris*	4	1.6%
Common water moss	*Fontinalis antipyretica*	3	1.2%
Fern-leaved pondweed	*Potamogeton robbinsii*	1	0.4%
Flat-stem pondweed	*Potamogeton zosteriformis*	3	1.2%
Floating-leaved pondweed	*Potamogeton natans*	21	8.3%
Fragrant waterlilly	*Nymphaea odorata*	4	1.6%
Grass-leaved pondweed	*Potamogeton gramineus*	11	4.3%
Leafy pondweed	*Potamogeton foliosus*	1	0.4%
Northern arrowhead	*Sagittaria cuneata*	1	0.4%
Northern watermilfoil	*Myriophyllum sibiricum*	17	6.7%
Quillwort species	*Isoetes spp.*	3	1.2%
Slender water-nymph	*Najas flexilis*	9	3.5%
Unknown	*Unknown*	1	0.4%
White waterbuttercup	*Ranunculus aquatilis*	2	0.8%
White-stemmed pondweed	*Potamogeton praelongus*	24	9.4%


Montana Fish, Wildlife & Parks
Waterbody: Swan Lake
County: Flathead
Date Sampled: Aug 24 & Sep 19-20, 2016
Sampling Points: 254
Secchi Disk: 10m
Surface Water Temp: 66°F
N
0 0.5 1 1.5 2 Miles
83
83
Sampling Results
Land/ No Access - No Sampling
Too Deep to Sample
No Species
Fragrant Waterlily
1-2 Natives Species
3-4 Natives Species
5-7 Natives Species

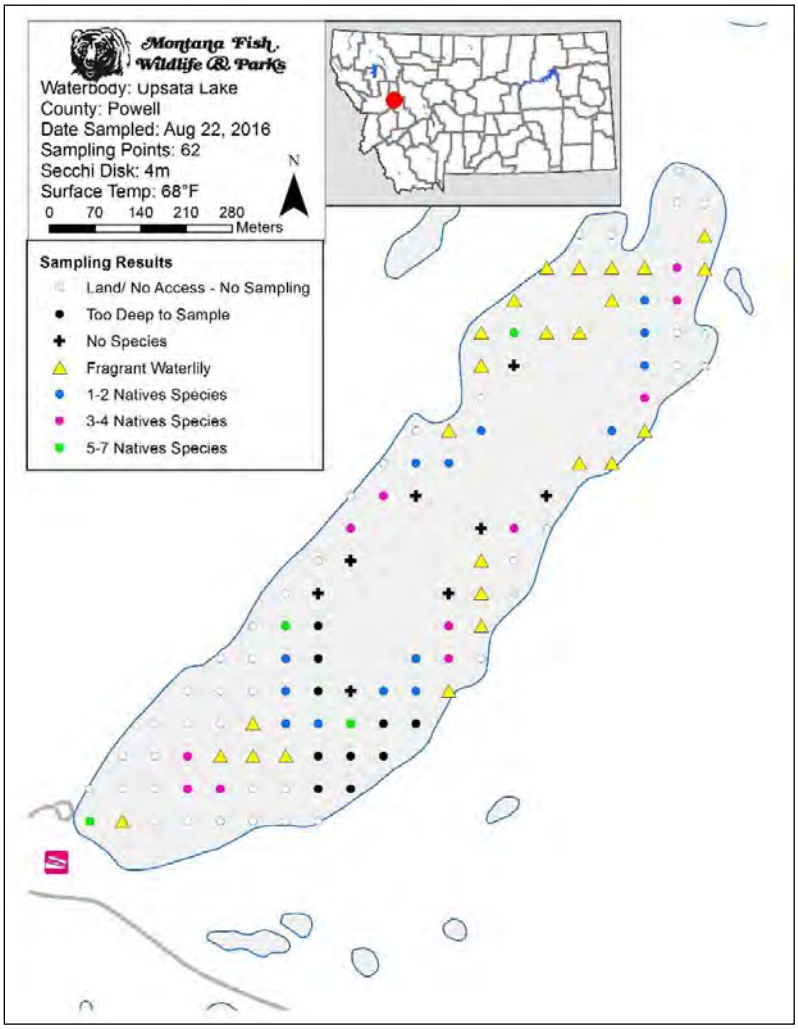
18. Tongue River Reservoir

Tongue River Reservoir	**n=318**		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	12	24.5%
Sago pondweed	*Stuckenia pectinatus*	53	16.7%
Leafy pondweed	*Potamogeton foliosus*	24	7.5%
American pondweed	*Potamogeton nodosus*	21	6.6%
Potamogeton Species	*Potamogeton spp*	21	6.6%
Canada waterweed	*Elodea canadensis*	14	4.4%
Coontail	*Ceratophyllum demersum*	12	3.8%
Chara spp.	*Chara spp.*	8	2.5%
Horned pondweed	*Zannichellia palustris*	5	1.6%
Needle spikerush	*Eleocharis acicularis*	3	0.9%
Slender leaved pondweed	*Potamogeton filiformis*	2	0.6%
Water smartweed	*Polygonum amphibium*	2	0.6%


Montana Fish, Wildlife & Parks
Waterbody: Tongue River Reservoir
County: Bighorn
Date Sampled: June 28-30, 2016
Sampling Points: 318
Secchi Disk: 4m
Surface Temp: 64°F
N
0
750
1,500
2,250
3,000
Meters
314
314
Sampling Results
Land/ No Access - No Sampling
Too Deep to Sample
No Species
1-2 Natives Species
3-4 Natives Species
5-7 Natives Species

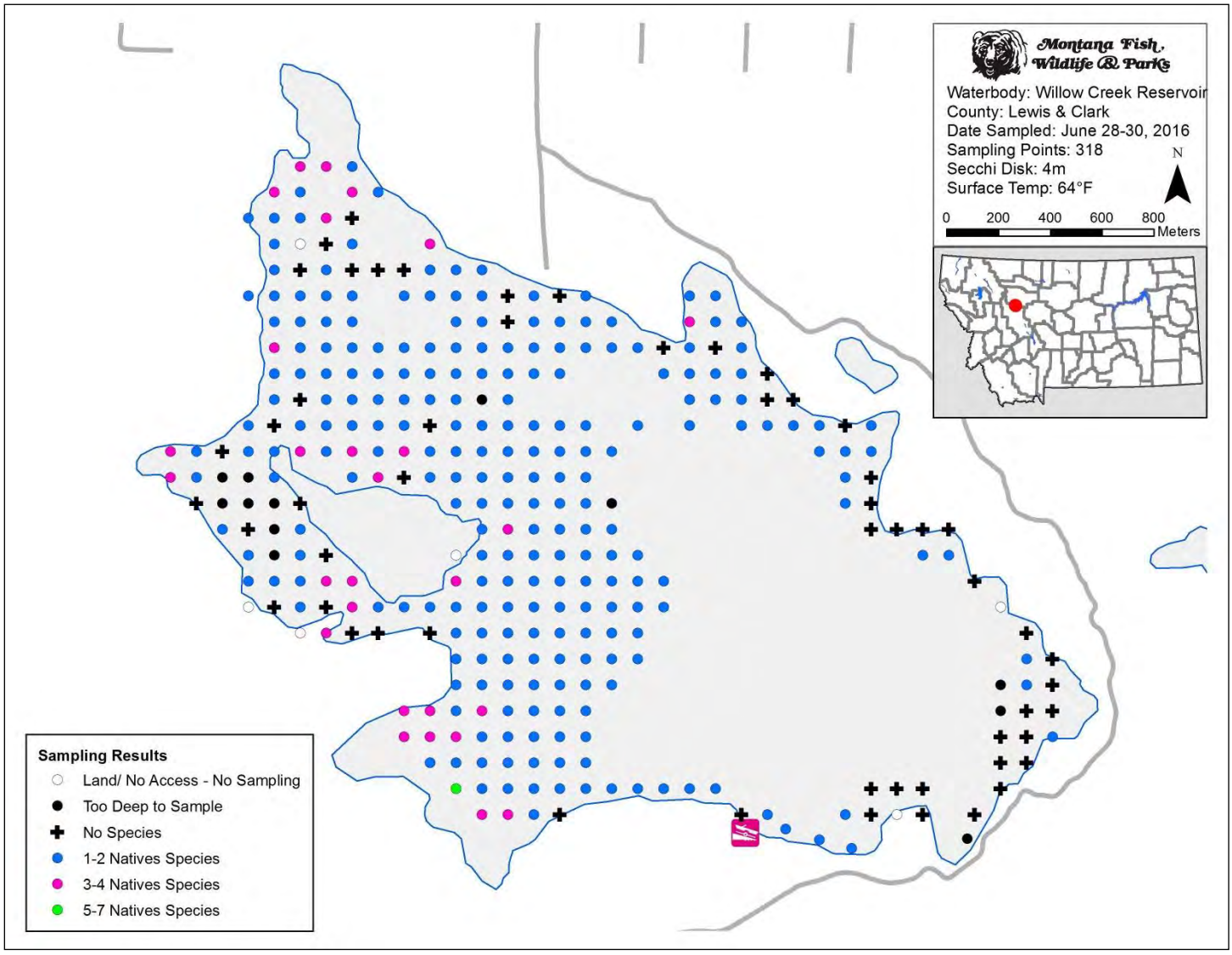
19. Upsata Lake

Upsata Lake	n=62		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	8	12.9%
Chara spp.	Chara spp.	39	62.9%
Common bladderwort	Utricularia vulgaris	35	56.5%
Fragrant waterlilly	*Nymphaea odorata*	25	40.3%
Northern watermilfoil	*Myriophyllum sibiricum*	25	40.3%
Fern-leaved pondweed	*Potamogeton robbinsii*	22	35.5%
Northern arrowhead	*Sagittaria cuneata*	14	22.6%
Leafy pondweed	*Potamogeton foliosus*	9	14.5%
Common water moss	Fontinalis antipyretica	8	12.9%
Slender water-nymph	*Najas flexilis*	5	8.1%
Mare's tail	*Hippuris vulgaris*	4	6.5%
Slender leaved pondweed	*Potamogeton filiformis*	4	6.5%
Nitella spp.	*Nitella spp.*	2	3.2%
Spatterdock	*Nuphar polysepala*	2	3.2%
Canada waterweed	Elodea canadensis	1	1.6%
Coontail	Ceratophyllum demersum	1	1.6%
Duckweed	*Lemna spp.*	1	1.6%
Watershield	*Brasenia schreberi*	1	1.6%



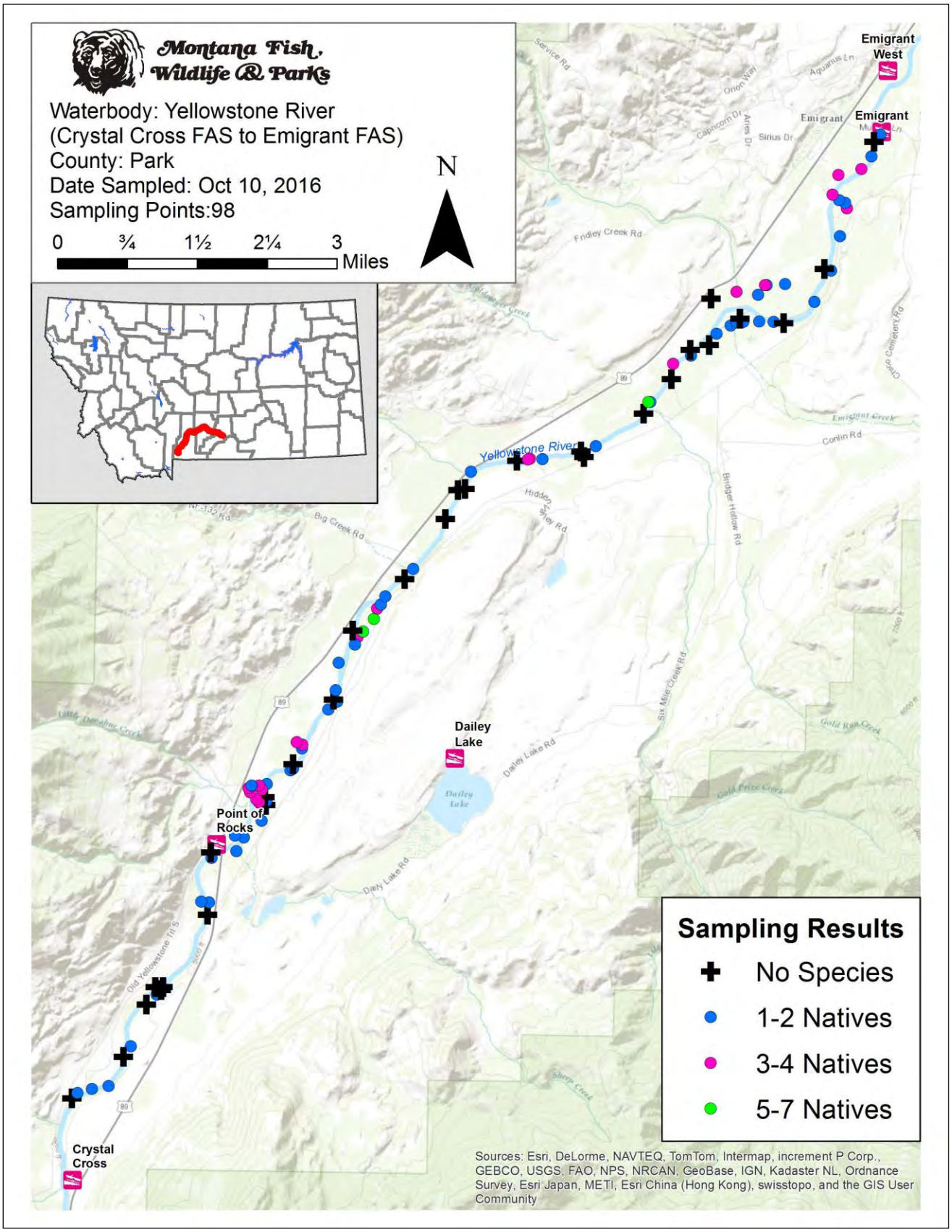
20. Willow Creek Reservoir

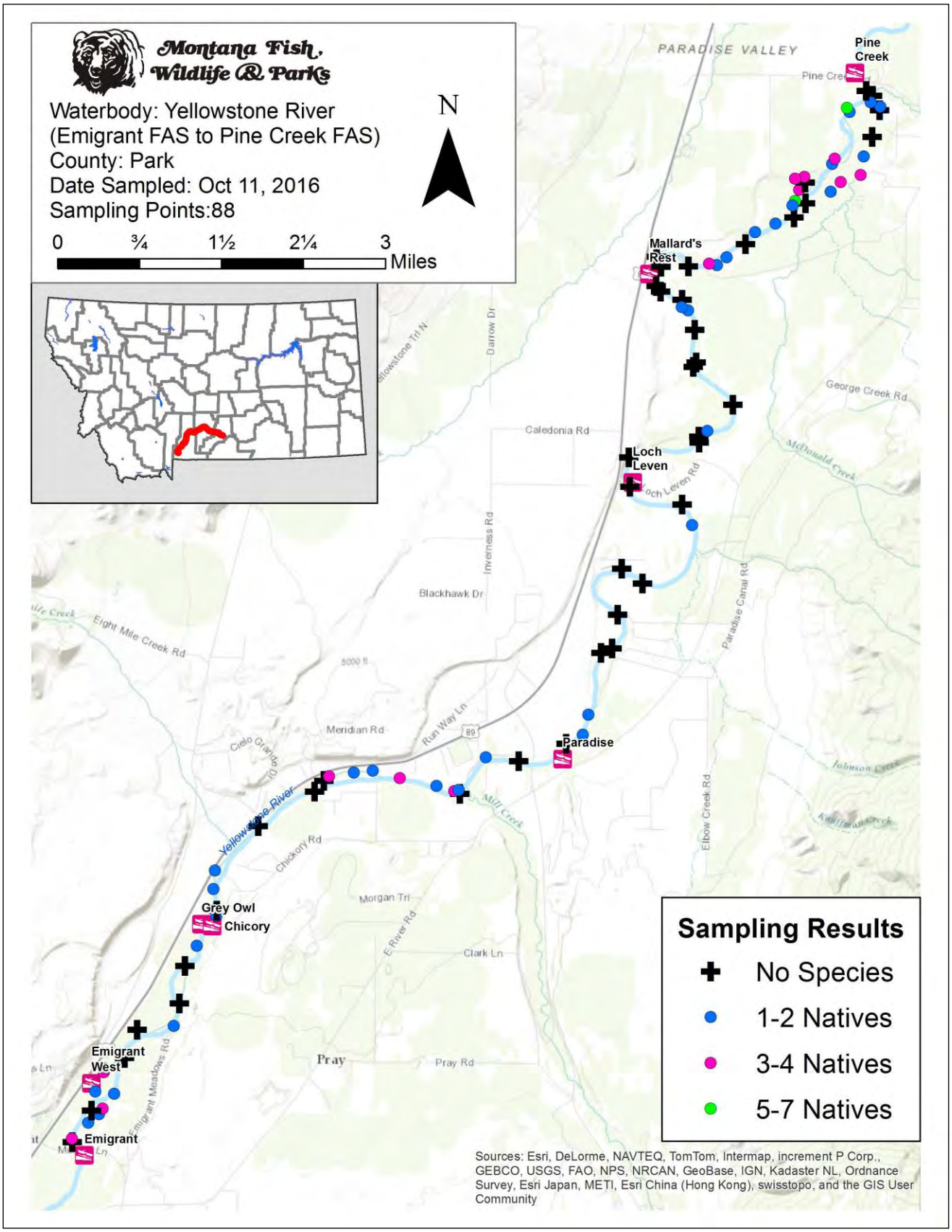
Willow Creek Reservoir	**n=318**		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	54	17.0%
Chara spp.	*Chara spp.*	250	78.6%
Leafy pondweed	*Potamogeton foliosus*	53	16.7%
Coontail	*Ceratophyllum demersum*	41	12.9%
White waterbuttercup	*Ranunculus aquatilis*	26	8.2%
Unknown	*Unknown*	15	4.7%
Northern watermilfoil	*Myriophyllum sibiricum*	2	0.6%
Quillwort species	*Isoetes spp.*	2	0.6%
Water smartweed	*Polygonum amphibium*	2	0.6%
Needle spikerush	*Eleocharis acicularis*	1	0.3%
Nitella spp.	*Nitella spp.*	1	0.3%

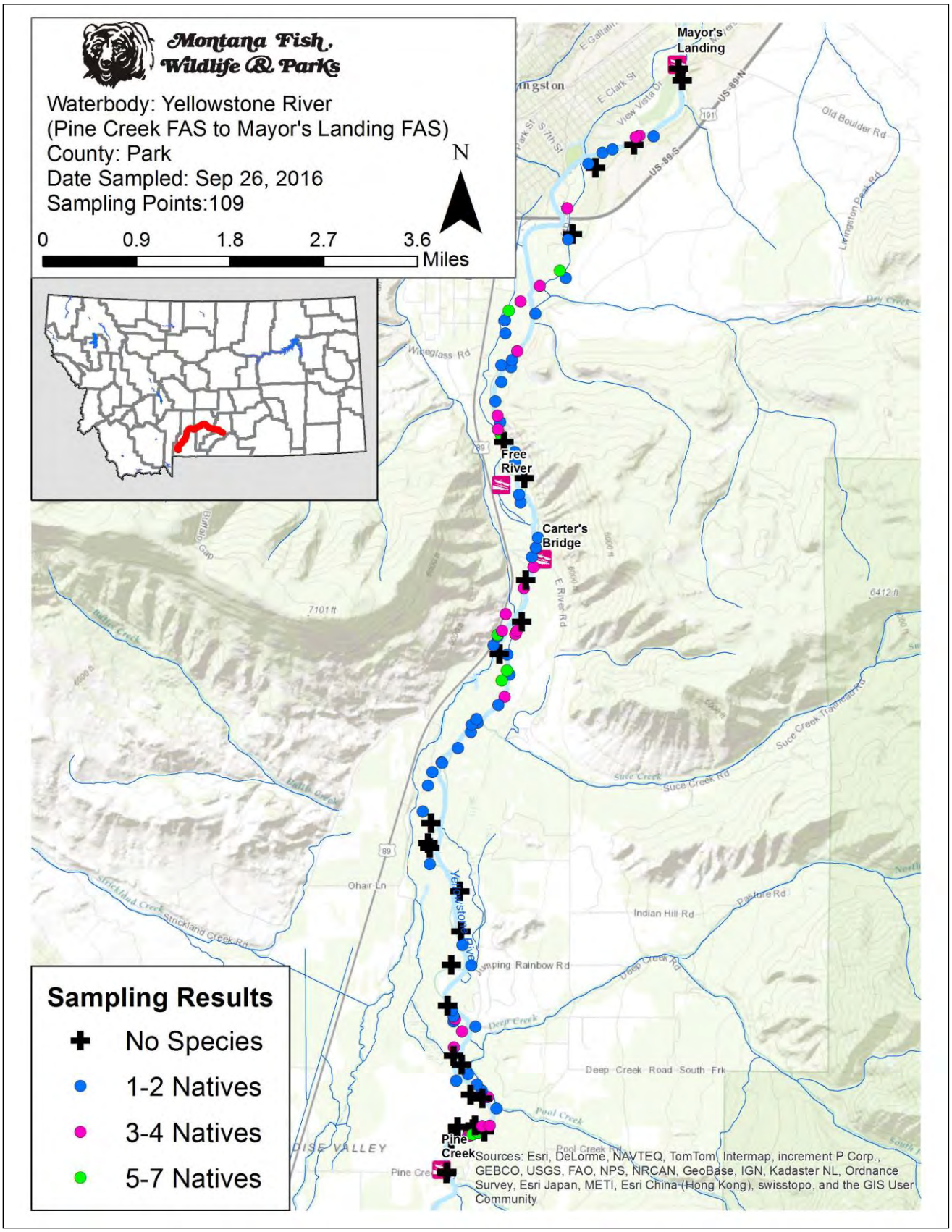


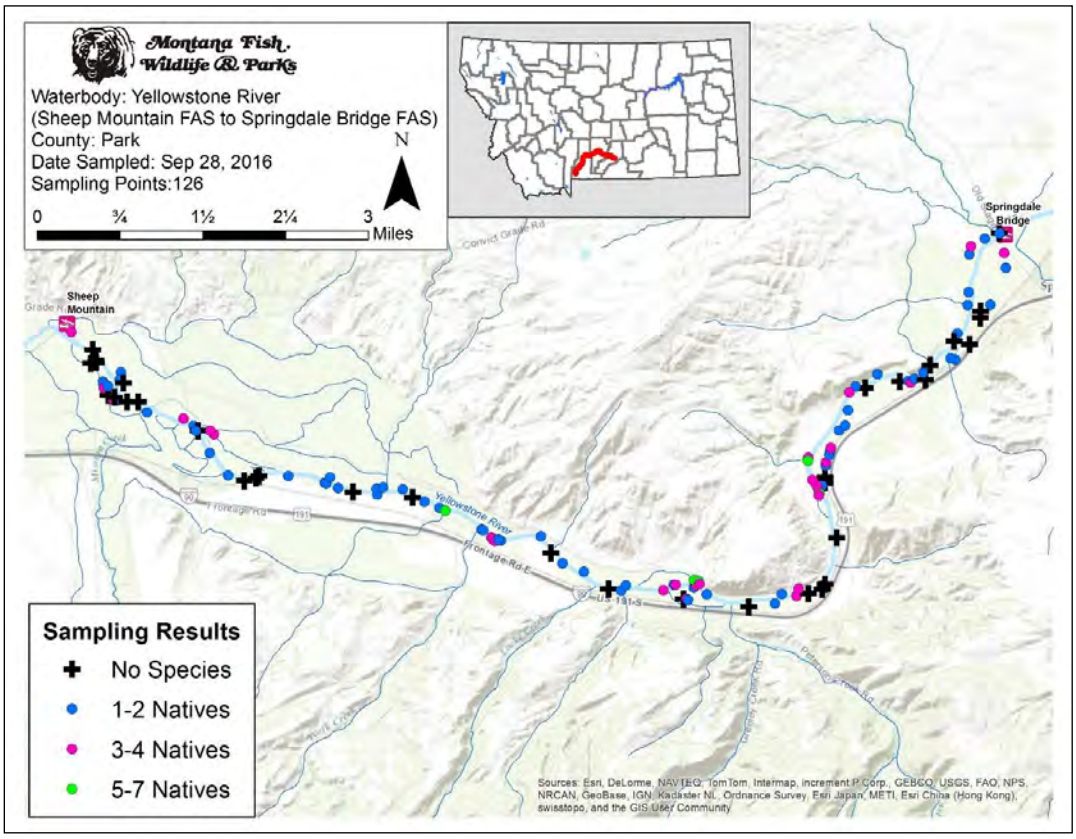
21. Yellowstone River (Below Gardiner to Holmgren Ranch FAS)

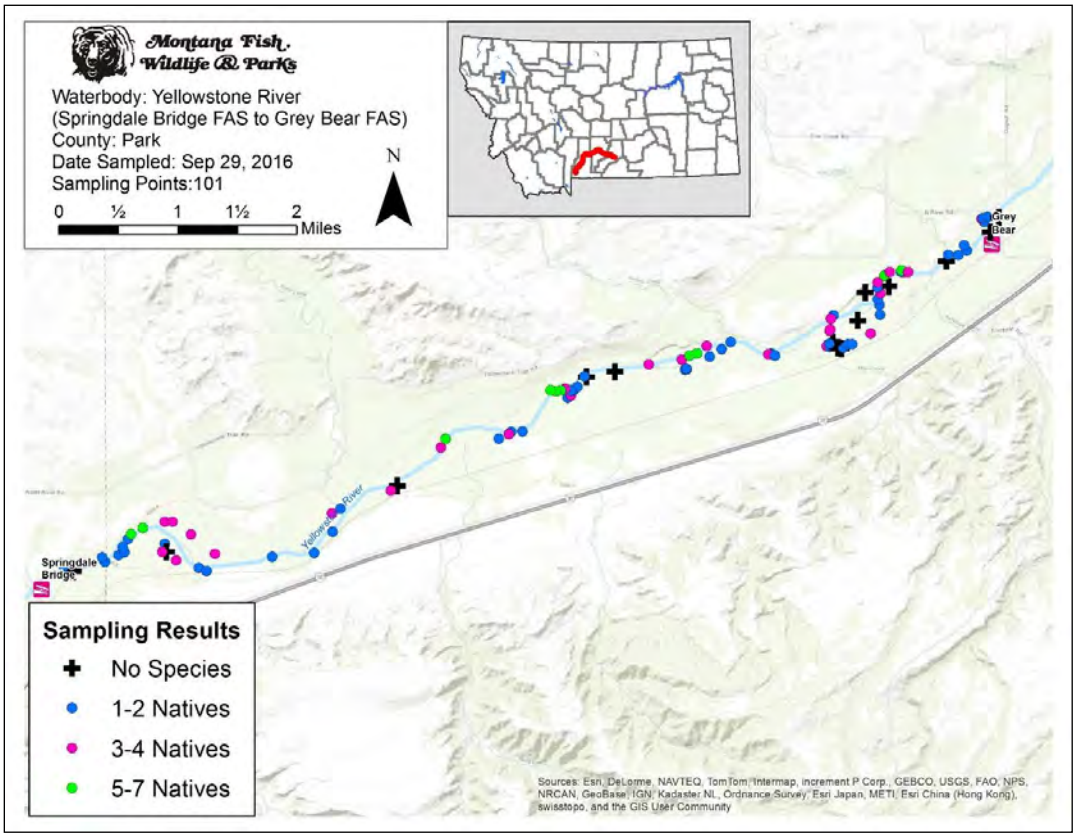
Yellowstone River	**n=990**		
Common Name	**Scientific Name**	**Count**	**Frequency**
No species detected	-	281	28.4%
Horned pondweed	*Zannichellia palustris*	505	51.0%
Canada waterweed	*Elodea canadensis*	336	33.9%
Slender leaved pondweed	*Potamogeton filiformis*	233	23.5%
Unknown	*Unknown*	142	14.3%
White waterbuttercup	*Ranunculus aquatilis*	113	11.4%
Northern arrowhead	*Sagittaria cuneata*	73	7.4%
Chara spp.	*Chara spp.*	66	6.7%
Water mudwort	*Limosella aquatica*	55	5.6%
Leafy pondweed	*Potamogeton foliosus*	41	4.1%
Duckweed	*Lemna spp.*	33	3.3%
Northern watermilfoil	*Myriophyllum sibiricum*	33	3.3%
Autumnal water-starwort	*Callitriche hermaphroditica*	11	1.1%
Water smartweed	*Polygonum amphibium*	5	0.5%
Bulrush spp	*Scirpus spp.*	2	0.2%
Coontail	*Ceratophyllum demersum*	2	0.2%
Juncus Spp	*Juncus spp.*	2	0.2%
Common water moss	*Fontinalis antipyretica*	1	0.1%
Mare's tail	*Hippuris vulgaris*	1	0.1%
Needle spikerush	*Eleocharis acicularis*	1	0.1%
Puzzlegrass	*Equisetum spp.*	1	0.1%
Quillwort species	*Isoetes spp.*	1	0.1%

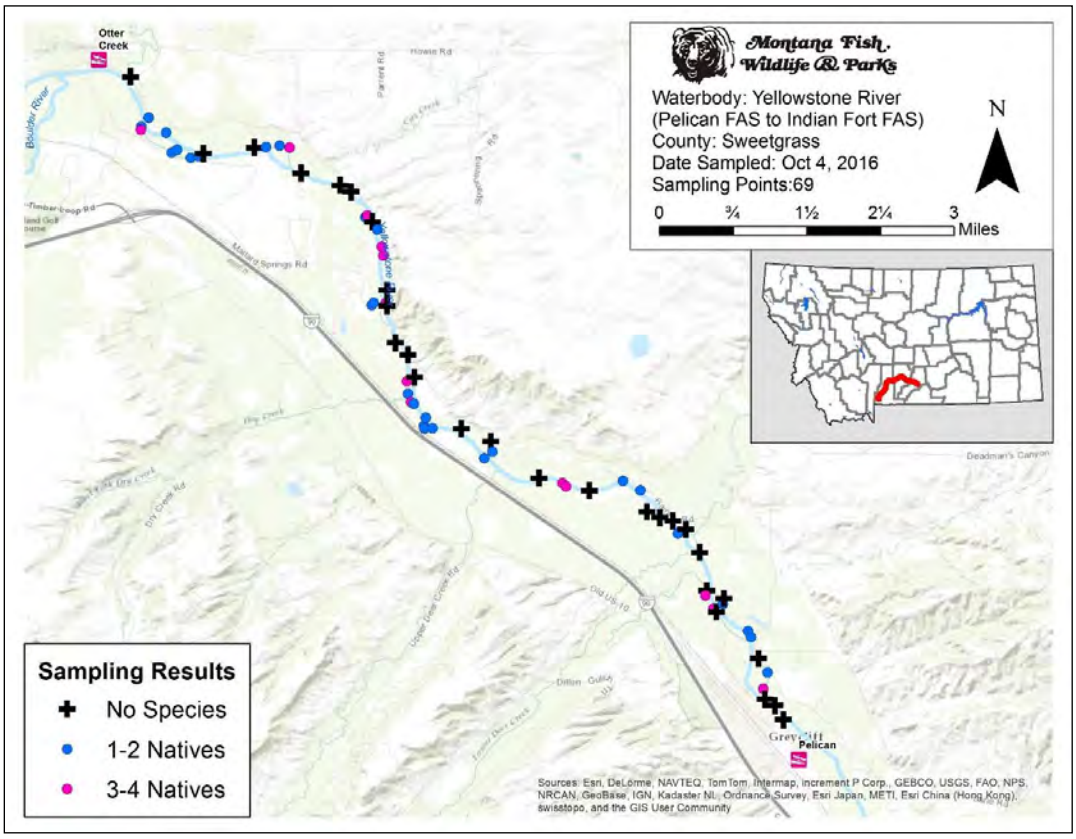

Montana Fish, Wildlife & Parks
Waterbody: Yellowstone River
(Crystal Cross FAS to Emigrant FAS)
County: Park
Date Sampled: Oct 10, 2016
Sampling Points:98
0 ¾ 1½ 2¼ 3 Miles
N
Emigrant West
Emigrant
Dailey Lake
Point of Rocks
Crystal Cross
Yellowstone River
Sampling Results
No Species
1-2 Natives
3-4 Natives
5-7 Natives
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

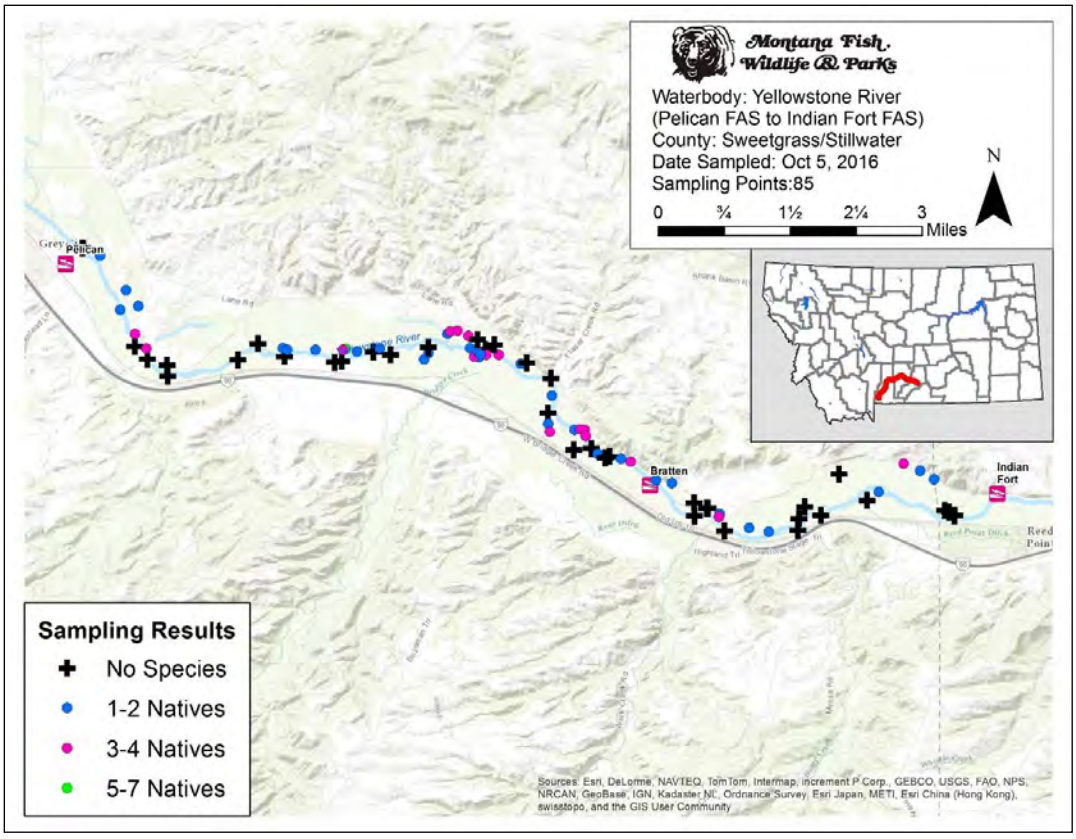

Montana Fish, Wildlife & Parks
Waterbody: Yellowstone River
(Emigrant FAS to Pine Creek FAS)
County: Park
Date Sampled: Oct 11, 2016
Sampling Points:88
N
0 ¾ 1½ 2¼ 3 Miles
PARADISE VALLEY
Pine Creek
Mallard's Rest
Loch Leven
Paradise
Grey Owl
Chicory
Emigrant West
Emigrant
Pray
Caledonia Rd
George Creek Rd
Blackhawk Dr
Meridian Rd
Chicory Rd
Pray Rd
Clark Ln
Morgan Trl
Eight Mile Creek Rd
Yellowstone River
Inverness Rd
Paradise Canal Rd
Elbow Creek Rd
Sampling Results
No Species
1-2 Natives
3-4 Natives
5-7 Natives
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

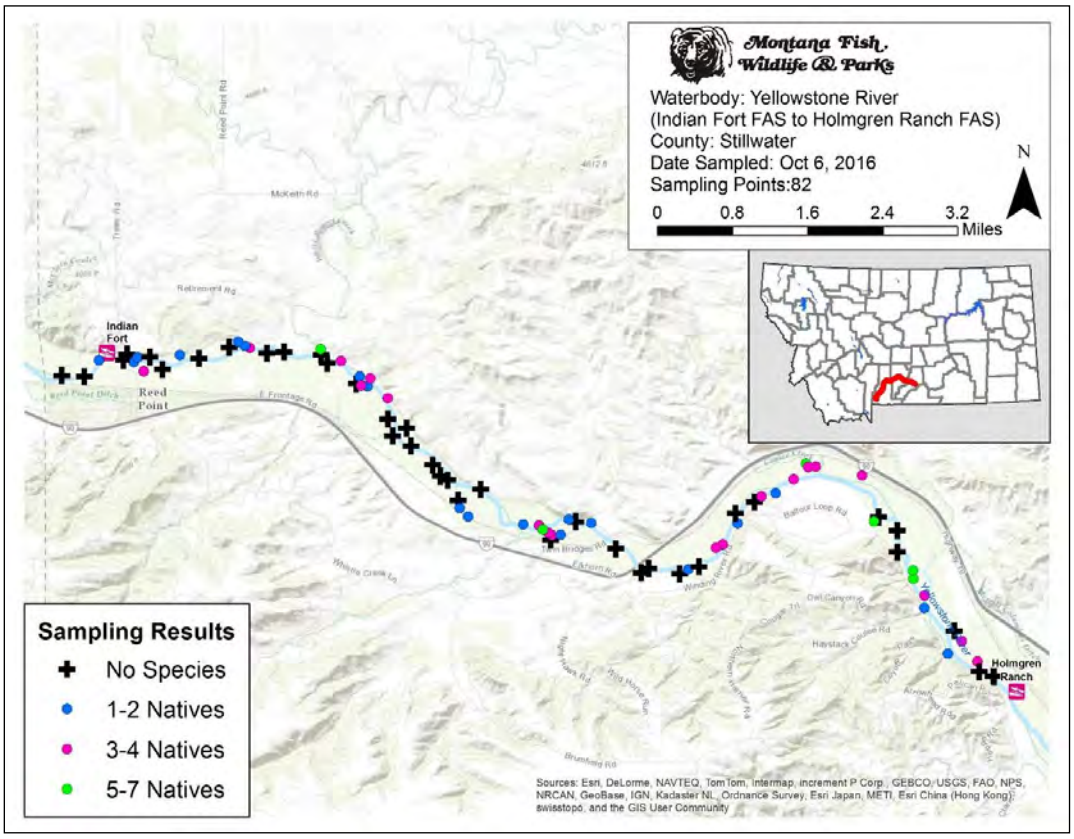

Montana Fish, Wildlife & Parks
Waterbody: Yellowstone River
(Pine Creek FAS to Mayor's Landing FAS)
County: Park
Date Sampled: Sep 26, 2016
Sampling Points:109
N
0 0.9 1.8 2.7 3.6
Miles
Mayor's Landing
Free River
Carter's Bridge
Pine Creek
Sampling Results
No Species
1-2 Natives
3-4 Natives
5-7 Natives
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community


Montana Fish, Wildlife & Parks
Waterbody: Yellowstone River
(Sheep Mountain FAS to Springdale Bridge FAS)
County: Park
Date Sampled: Sep 28, 2016
Sampling Points:126
N
0 ¾ 1½ 2¼ 3 Miles
Sheep Mountain
Springdale Bridge
Yellowstone River
Frontage Rd
Sampling Results
No Species
1-2 Natives
3-4 Natives
5-7 Natives
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

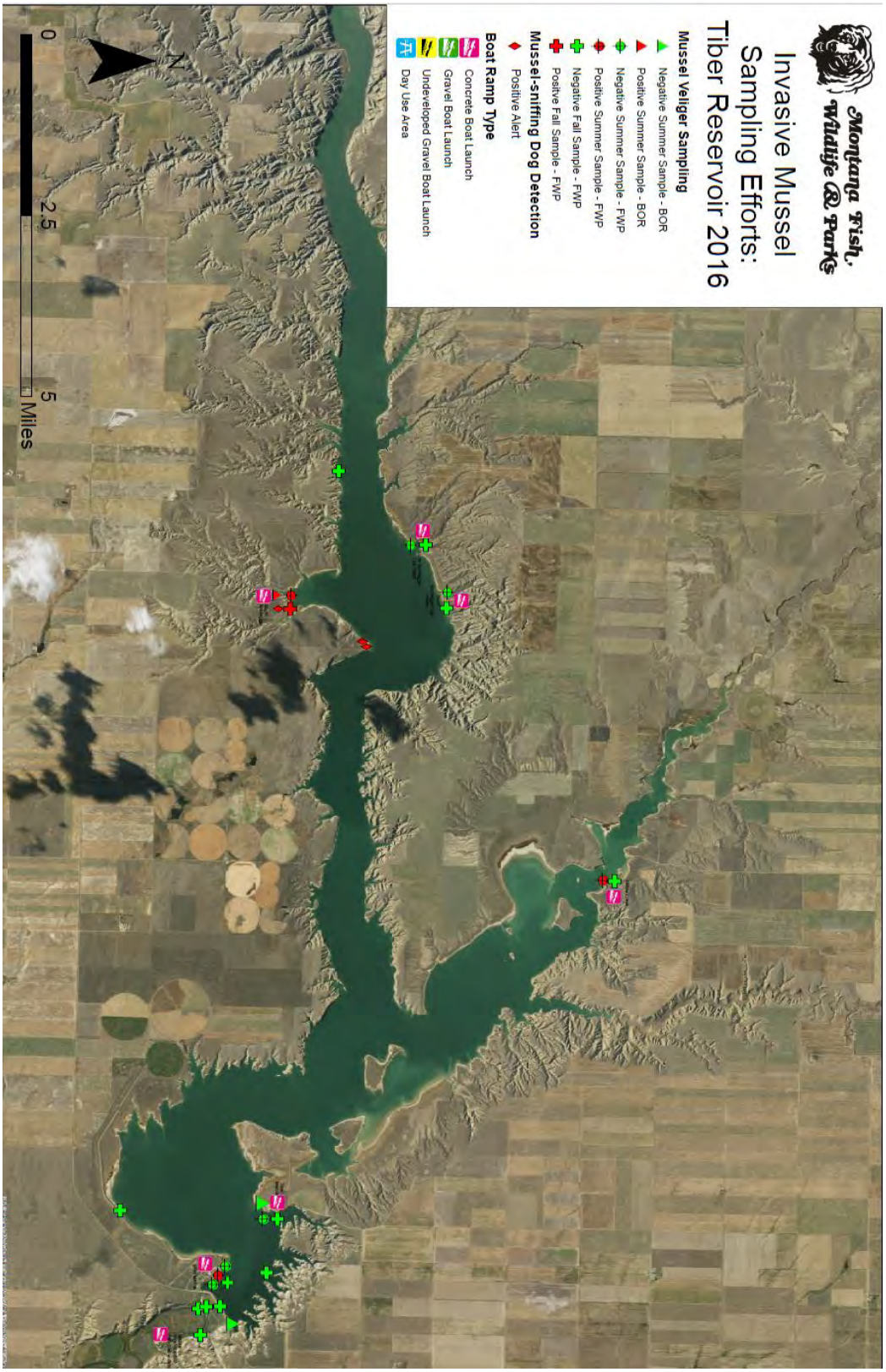

Montana Fish, Wildlife & Parks
Waterbody: Yellowstone River
(Springdale Bridge FAS to Grey Bear FAS)
County: Park
Date Sampled: Sep 29, 2016
Sampling Points:101
N
0 ½ 1 1½ 2 Miles
Springdale Bridge
Grey Bear
Yellowstone River
Sampling Results
No Species
1-2 Natives
3-4 Natives
5-7 Natives
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community


Otter Creek
Pelican
Montana Fish, Wildlife & Parks
Waterbody: Yellowstone River
(Pelican FAS to Indian Fort FAS)
County: Sweetgrass
Date Sampled: Oct 4, 2016
Sampling Points:69
N
0 ¾ 1½ 2¼ 3 Miles
Sampling Results
No Species
1-2 Natives
3-4 Natives
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

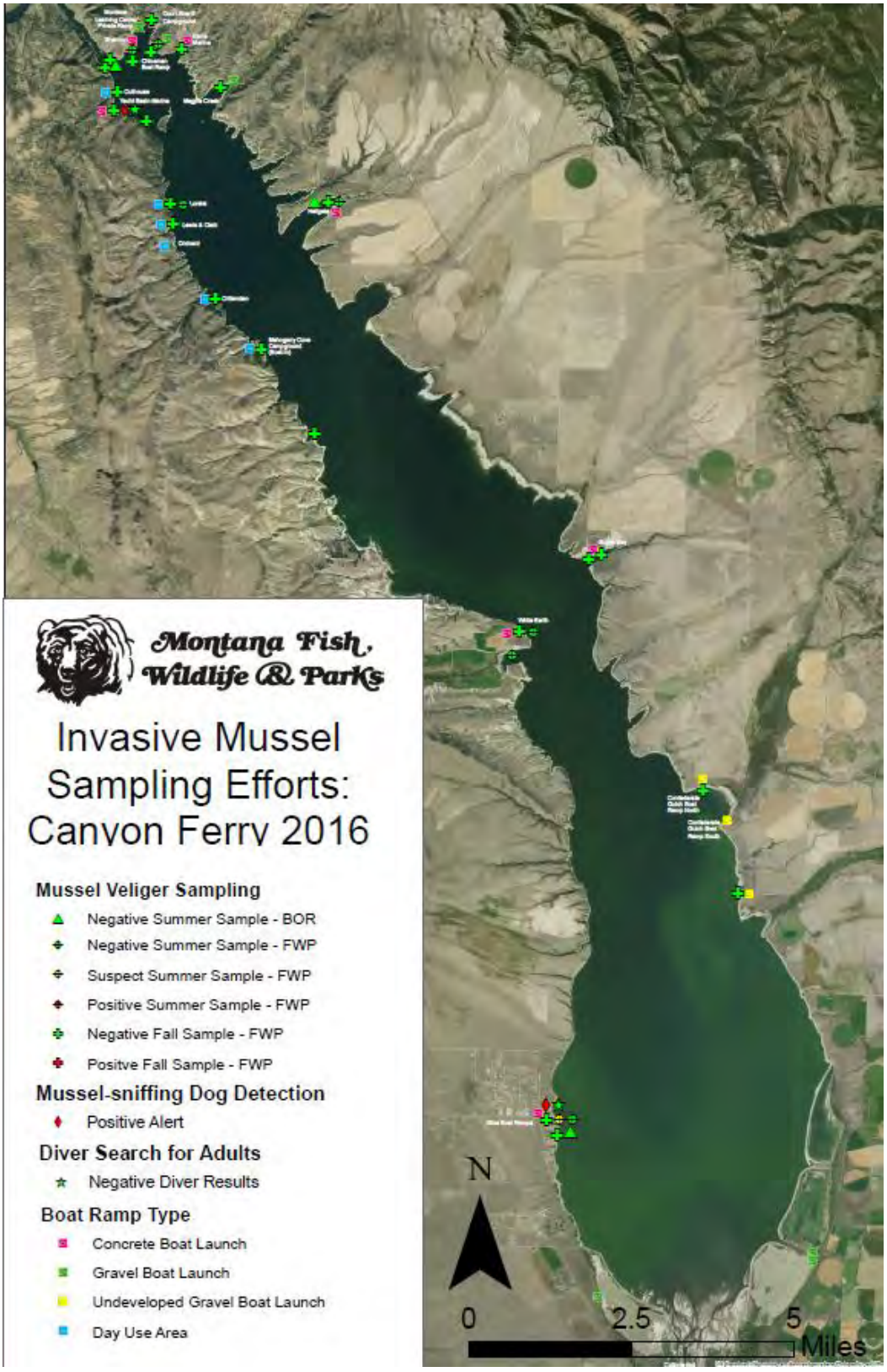

Pelican
Bratten
Indian Fort
Montana Fish, Wildlife & Parks
Waterbody: Yellowstone River
(Pelican FAS to Indian Fort FAS)
County: Sweetgrass/Stillwater
Date Sampled: Oct 5, 2016
Sampling Points:85
N
0 ¾ 1½ 2¼ 3 Miles
Sampling Results
No Species
1-2 Natives
3-4 Natives
5-7 Natives
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community


Montana Fish, Wildlife & Parks
Waterbody: Yellowstone River
(Indian Fort FAS to Holmgren Ranch FAS)
County: Stillwater
Date Sampled: Oct 6, 2016
Sampling Points:82
N
0 0.8 1.6 2.4 3.2
Miles
Indian Fort
Reed Point
Holmgren Ranch
Sampling Results
No Species
1-2 Natives
3-4 Natives
5-7 Natives
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

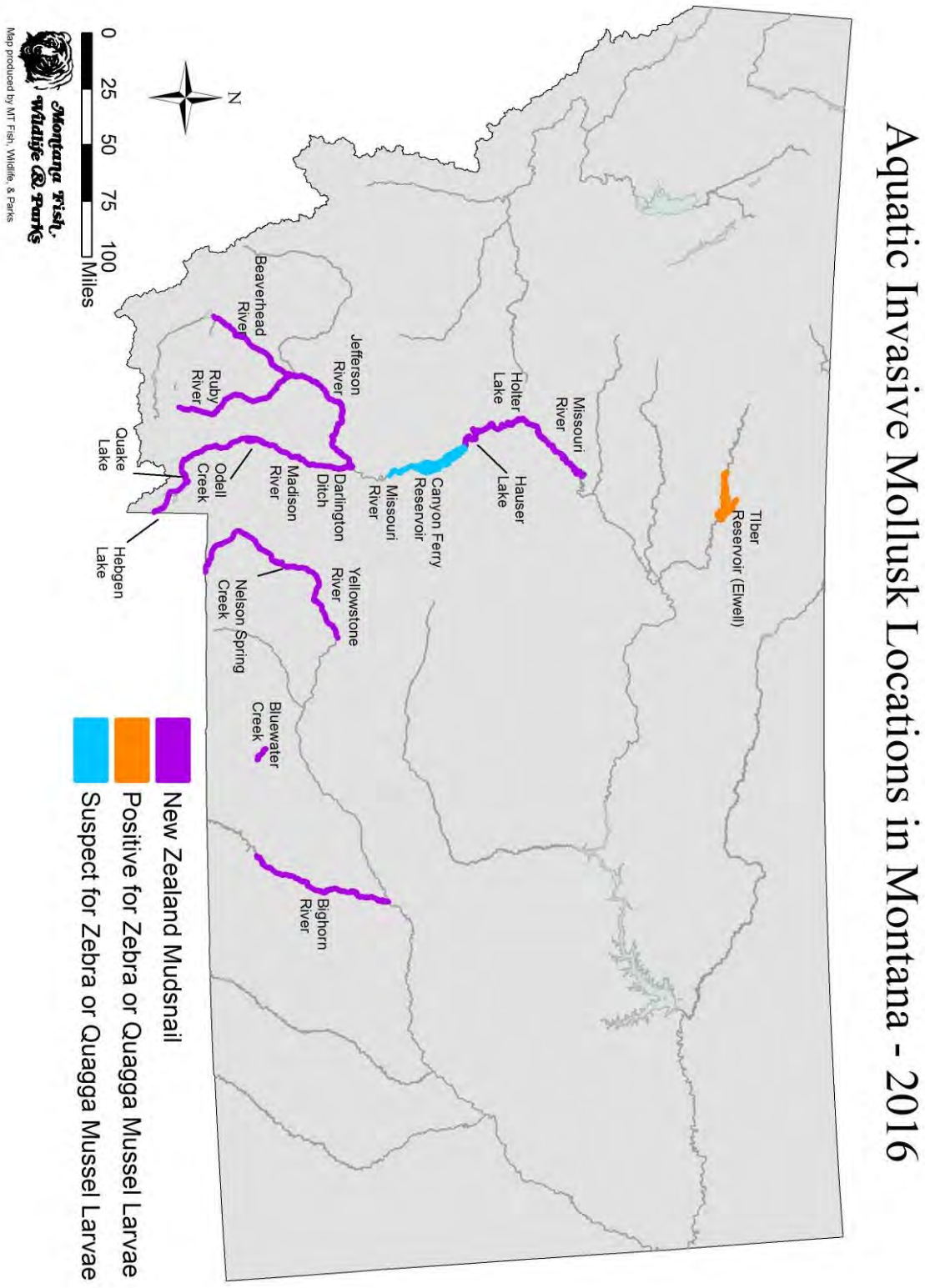
Appendix B. Mussel response sampling events on Tiber Reservoir



Appendix C. Mussel response sampling events on Canyon Ferry Reservoir



Appendix D. Map of invasive mollusks in Montana



Appendix E. Map of invasive plants in Montana